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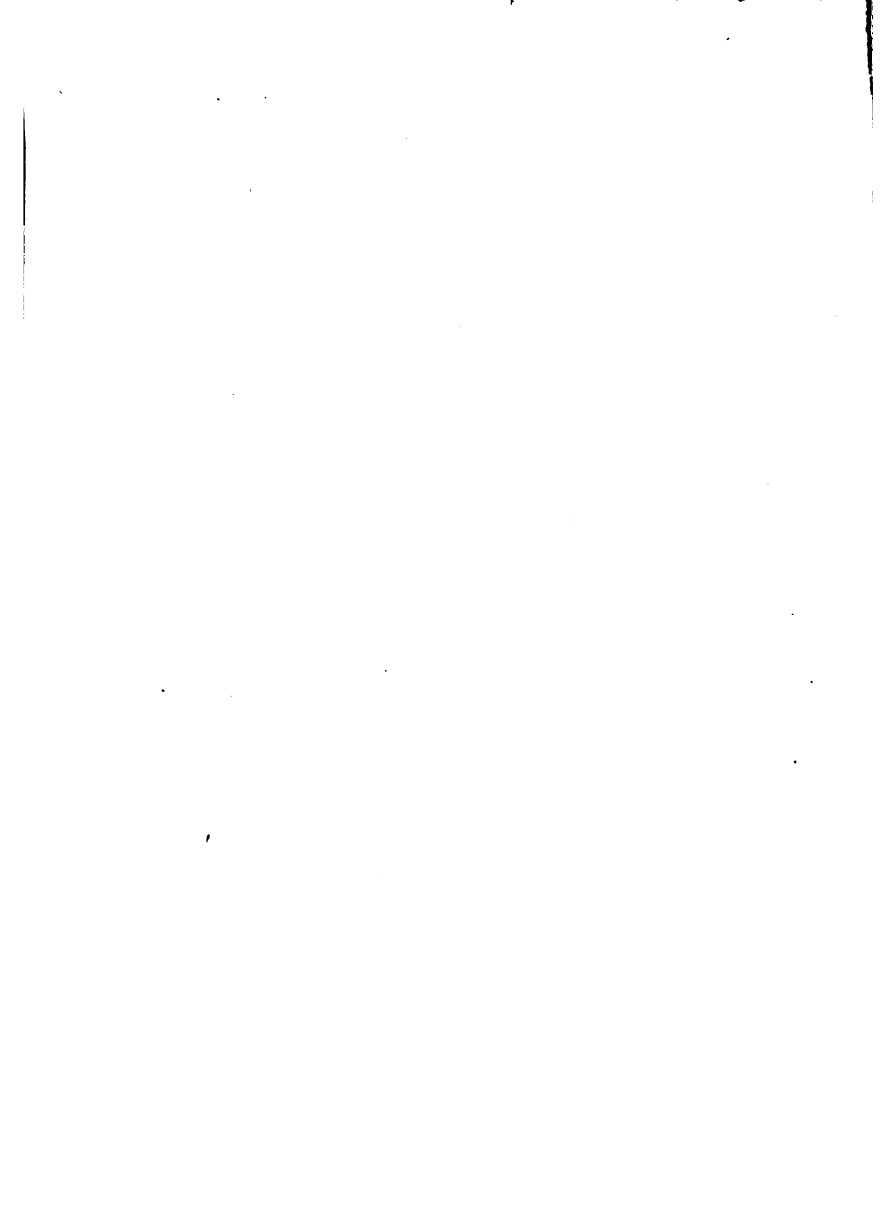
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9

THE CHILD'S BOOK OF HEALTH

IN EASY LESSONS FOR SCHOOLS

BY

ALBERT F. BLAISDELL, M.D.

AUTHOR OF "OUR BODIES AND HOW WE LIVE," "HOW TO KEEP WELL"
"LIFE AND HEALTH," AND "PRACTICAL PHYSIOLOGY"

REVISED EDITION

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PREFACE TO REVISED EDITION

In this revision, as in the previous editions of this book, the author has aimed to present, in a manner interesting and intelligible to the youngest reader, the simplest facts about our bodily life. The book is simple and terse in its wording, familiar and suggestive in its style. Its aim is to interest and stimulate little folks to learn a few things about everyday matters of health.

The author believes that the real object in introducing physiology into the lower grades of schools is to teach young people how to keep well and strong. Hence special emphasis has been laid, in the several lessons of this book, upon such points as concern the personal care of health.

The teacher must not rest content with merely having the pages of the text read. Each and every topic in the lessons should be so explained and illustrated that the facts will be fastened in the pupil's memory. Interesting material from other sources,

simple experiments, blackboard sketches, writing exercises upon the blackboard and in the notebook, should supplement the use of the text-book.

This book complies with the laws of those states which require in their public schools the study of the nature and effect of alcohol, tobacco, and other narcotics upon the human system.

A. F. BLAISDELL

WINCHESTER, MASS.

July, 1905

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THE CHILD'S BOOK OF HEALTH

LESSON I

WHY WE SHOULD TRY TO KEEP WELL

Did your father or mother ever give you a pretty watch? If so, you know what pains you took to learn how to take good care of it. You were told when and how to wind it. You opened it, perhaps, and learned a few things about it by watching the wheels and springs. If you took good care of it, you found, even after you had carried the watch for several months, that it was not a bit the worse for use.

Now your own body, the house in which you live, is in many ways like a delicate machine,—like a watch or a steam engine for instance,—with many parts, both inside and outside, that need your best care. The Creator has given this most wonderful

machine into your keeping. Whether it goes well or ill depends very much upon the care you take of it.

As you must know the use of your watch, and that it will keep better time if you wind it up regularly and keep it clean and neat, so you must understand the use of the different parts of your bodies,—such as the stomach, the lungs, the heart,



A STRONG SCHOOLBOY

He has used dumb-bells every day

and the skin,—in order that you may take better care of them.

You will have much better health if you begin, even while quite young, to learn a few things about this wonderful body

of yours. We cannot be ill without making trouble for those with whom we live, and causing them expense and loss of time. We can prevent a great deal of sickness if we will only learn to watch carefully over our health.

Let me show you a picture of a young boy who has always taken good care of his health. See how strong he looks! Would you not think that



A LESSON FROM THE BLACKBOARD

he could do a great deal of hard work? Indeed he can, and that, too, without getting very tired.

Even while you are boys and girls you can easily learn and remember many simple but important

matters about your everyday health. There is, of course, much more for you to learn as you grow older. After you understand all that is told you in this little book, we hope you will be glad to learn more from some larger book.

You must not be content with simply reading what there is in this book. You can use your paper and pencil and the blackboard to help make this study as interesting as a picture book.

Learn to use your pencil and the crayon, so that you can draw little pictures, however simple and crude, of important parts of "the house you live in." Read over and over again the health hints written for you on the blackboard, until you come to know them as you do the pictures of your reading book.

Your teacher, I am sure, will tell you how to make some simple, easy experiments. Try them for yourself, and then think out others that you can perform without anybody's help.

LESSON II

THE GENERAL BUILD OF THE BODY

If you were going to buy a house, you would certainly look at it carefully from the outside before you went inside. You would notice its build as a whole, whether it was a three-story house or a cottage, whether it was painted white or brown, whether its roof was shingled or covered with slate, and so on.

So it is with the study of your body: if you would learn how to take care of it, you must have some general idea of its build. This will also help you to understand what is told you in the following lessons.

If you look at your own body, or that of some playmate, you will see a middle part, which we call the **trunk**. Above this is a rounded part, called the **head**. The **limbs** — that is, the two arms and the two legs — are attached to the upper and lower corners of the trunk.

Now your body is covered with a tight-fitting or outside garment. Pinch this outside covering

of your hand and see how soft and elastic it is, and how nicely it fits. This, you know, is the **skin**.



SCHOOLGIRL

Proving that the skin is soft and elastic

If you could look beneath this, as you sometimes can when you have had a bit of skin torn from your finger, you would find red flesh. This is the same as the beefsteak we see in the market. We call this **muscle**.

Press your fingers tightly around your arm or knee and you will feel something firm and hard. These hard parts are the **bones**. They make up the framework of our bodies.

The most important parts of the body are in the trunk. Suppose the front part of the body could be opened, like the door of a bookcase, and you could look inside, what would you see? Why, you would



A LESSON FROM THE BLACKBOARD

see a thin arch of muscle dividing the inside of the trunk into two parts, like a two-story house.

The room upstairs, called the **chest**, holds the **heart** and the **lungs**.

The room downstairs, called the **abdomen**, holds the **stomach**, **bowels**, **liver**, and other vital parts.

LESSON III

WHAT THE BONES ARE USED FOR

When a carpenter builds a house he first puts up a framework of strong boards and timbers, which is really only an outline of what he is going to make. But this framework must be strong enough to support the weight of the clapboards, shingles, windows, and the other parts. Now animals, as well as houses, must also have some kind of frame to give their bodies form or shape.

This framework in most animals is chiefly made up of a hard substance called **bone**. Some animals, like the oyster, have this framework on the outside, and some, like a fish, have it on the inside. Turtles, as you may remember, have a strong, hard shell on the outside, and also bones on the inside.

The frames of our bodies—the houses we live in—are made of **bones**. The flesh and skin cover them somewhat as the carpenter's boards, shingles, and plaster cover the frame of a house.

Is this use as a framework all that bones are good for? No, they serve many other useful purposes. They help the body to keep its natural shape and they give support to the soft parts. They also protect very important or vital organs. What helps to keep your heart and lungs from getting crushed? Why, the ribs with their barrel-shaped cage of bones. What would keep the soft and delicate brain from harm if it were not shut up in the box of bones called the **skull**?

What else are bones used for? Let us think. You will read pretty soon of the flesh or muscles of the body, which give us the power to stand up and move easily. Now the outside of the bones is fitted with sharp edges, little knobs and rough surfaces, to which the muscles themselves, or their tapering ends, are tied.

Then there are also little grooves and holes in the solid bone, in which are sheltered tiny blood vessels, and the delicate little nerves,—the telegraph wires of the body. In brief, we may think of the bones as a kind of foundation upon which our bodily house is securely built.

LESSON IV

A FEW MORE THINGS ABOUT BONES

How many bones do you suppose there are in your whole body? Let me tell you. There are over two hundred, and they are of many sizes and



THE SKULL

Front view

shapes. They form about one seventh of the whole weight of the body. When properly adjusted and held in place the bones make what is called the **skeleton**. Of course you know how a picture of the skeleton looks.

Now, do not for one minute think that you must learn the names of all these bones. When you are older you may wish to study about them from a larger book. Let me tell you, however, just a few things about some of them.

The skeleton, or bony framework of the house we live in (a house far more wonderful than any king's palace, for it can walk, and it feels the heat and the cold), consists of the bones of the **head**, the **trunk**, and the **limbs**.

The bones of the head make a strong, round case called the **skull**. The top part is formed into a kind of roof which shelters the brain. Let us see what this roundish box of bone—the cupola of our bodily house—holds. Our **eyes**, with which we see; our **ears**, with which we hear; our **mouth**, into which we put our food; the **nose**, with which we smell; and then our **brain**. Indeed, it is a very precious box, we think.

What is meant by the **trunk**? You know what the trunk of a tree is. Well, like the tree, our trunk is the main part of the body. Let us



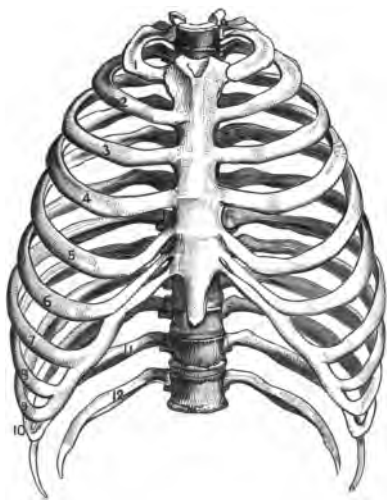
THE BACKBONE
Seen from the right
side

think of its bones as the **backbone**, the **ribs**, and the **hips**.

The **backbone** is a tapering column of odd-looking bones, piled one on top of another. You can feel its

little bony ridges by running your fingers up and down the middle of the back.

The next time you see a fish on the table, notice the large middle bone. It is the fish's backbone. It will give you some idea of the way your own backbone is built. Look at a picture of the



THE BONES OF THE TRUNK

Showing how the ribs are attached to the breastbone, and also showing a part of the backbone

like? Why, a caterpillar, with its head half raised as it crawls on the ground.

Did you ever try to count your **ribs**? Well, it is not so easy as you may think to count twelve of

them on either side. They start from the backbone, and bend round your chest somewhat like the hoops of a barrel. Press both hands on your side, take a long, deep breath, and you can feel the ribs move.

Every child knows how to rest his hands upon his **hips**, the two strong bones which may be compared to the sills of the house you live in. There is a shallow pit on the outer side of each hip bone, about as large as a toy china teacup, into which the round head of the **thigh bone** fits.



THE RIGHT SHOULDER
BLADE

LESSON V

MORE ABOUT THE BONES



THE LARGE
BONE OF
THE ARM

Would you like to find your **collar bone**? Run your fingers across the top of the chest, and there you may easily feel a slender bone. If you will put your hand on the back of your shoulder, where officers wear their epaulets, you will feel a bone which seems to dance with every movement of your arm. This is your **shoulder blade**. Now feel for the bone in your arm above the elbow. It is long and strong and fits into the shoulder blade, reaching to the elbow, where it meets the two



THE BONES OF
THE FOREARM

bones of the **forearm**.

In your **wrist** there are eight little bones. Next to these are the bones of the **hand**, ending with the fingers.



BONES OF THE RIGHT HAND

and the blind can read with their fingers!

How useful are the **legs** to every part of the body! Without the bones in our legs we could not stand or walk. The longest and strongest bone in the body — the **thigh bone** — reaches from the hip to the knee. There are two bones in the leg below the knee.

Just think of the marvelous things we do with our hands! How wonderful it is that the deaf and dumb can talk with their hands,



THE THIGH BONE

Seven queerly shaped bones bound tightly together make the **ankle**. We have, you all know, ten **toes**,—five on each foot. The **foot**, as well as the hand, can be made to do some wonderful things. Think of people who can write, feed themselves, and handle tools with their toes!



BONES OF THE
LEG BELOW
THE KNEE



BONES OF THE RIGHT FOOT, SEEN FROM THE SIDE

Would n't you think that our bones would get dry and rub so hard against each other that it would hurt us? Indeed they would if they were not put together with many curious hinges or **joints**. Nature very kindly oils the ends of the bones for us. This makes them rub together smoothly.

Perhaps you have seen a fireman oil the joints of his engine. He must do this several times every

day, else his engine will soon be ruined. Think of a Being who can build a machine like the body, that will run for many years and keep its own joints oiled all the time!

What keeps the ends of the bones together? Why don't they slip out of place? They do sometimes. Haven't you known of some one whose elbow has been put out of joint? Well, the bones would be continually slipping out of place if they were not tied to each other by **cords** and **bands**. If you bend your finger back and forth rapidly, you can see these cords move under the skin.



TWO RIBS

Showing how they are fastened to the side of the backbone by bands

You will find out, when you are older, that it takes some skill to carve a turkey, because you must cut round the tough, gristly cords to get them apart neatly before you can serve the meat out in pieces for the plate.

LESSON VI

HOW TO TAKE CARE OF THE BONES

The bones of children are soft and easily bent, but they become harder as they grow older. The bones of old people are dry, hard, and brittle. You know that the bones of children more often bend than break in the many tumbles they get, while the



EFFECTS OF POORLY FITTING SHOES UPON THE BONES OF THE FEET

The large toe of either foot is crowded on to the second toe, and the remaining toes are pressed together in the wrong direction

bones of very old people, being brittle, may snap like pipestems with a very slight fall.

How often we see on the street young children with legs bent like a bow! Too bad, isn't it? They have been allowed to stand and walk before their bones were hard enough to bear up their bodies, so the bones are bent, and these poor children become bow-legged.

Will tight clothing ever change the shape of the bones? Certainly. It will not only crowd some of the bones out of place and change their shape but it will hinder the free flow of blood. The lungs, the heart, the stomach, and other parts of the body have just enough room in which to do their work properly. If our clothing squeezes them into smaller space, these vital parts are hindered in doing their duties, and great harm is very apt to be done to our health.



PROPER POSITION WHILE STUDYING
AT A SCHOOL DESK

It is much the same with the feet. How silly and harmful is the habit of wearing short, narrow, and pointed shoes, and tight, high-heeled boots! Why? Because the weight of the body pushes the foot forward into the shoe, and the foot crowds the toes

into the tight part. This is apt to cause tender feet, corns, ingrowing nails, and the like, to say nothing of a stiff and ungainly gait.



PROPER POSITION WHILE STANDING
TO READ

You must not get into the habit of bending over too much while at your reading or sewing. Almost before you know it you will have stooping shoulders.

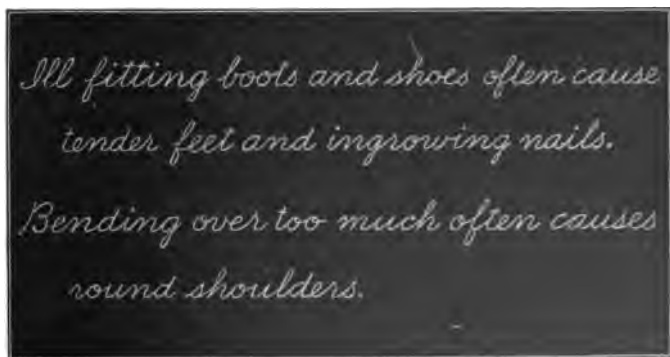
Look at that old grandfather whose head and shoulders are bent forward. His bones have grown and hardened into that shape, so that

now he could not stand up straight as you do if he tried ever so hard. Your teacher should see that you have a seat and a desk at school of just the right size and height, so that there will be no strain

on your shoulders and back. While sitting at your school desk, do not get into the habit of bending forward and leaning against the desk, or of sliding down into the seat, or of sitting on the foot.

Do you want to grow straight and strong? Then you must learn to sit and stand straight.

School desks should not be too low, thus causing a forward stoop; or too high, thereby throwing one shoulder up too much, and giving a twist to the



BLACKBOARD WORK

spine. If the seats are too high, the feet will have no support; if too low, there will be undue strain on the shoulder and the backbone.

You must not think that the bones in your body are like the old bones you sometimes find on the street or in the field. These are dead, and as dry and hard as a rock. Bones grow like any other part of your bodies. The bright red blood runs through the living bones and gives them a beautiful pinkish tint.

Beer, wine, hard cider, and other alcoholic liquors make the blood less fit to feed the bones, and so do them harm. Tobacco is hurtful to young people; it may stunt the growth of their bones.

WRITING EXERCISES

The bones are the framework of the body.

The bones are to the body what ribs are to a vessel, or a steel frame is to a tall building.

Without bones we could not move about or do what we please.

Bones give shape, support, and protection to the body.

The bones of children are soft and easily bent.

The bones of old people are hard, brittle, and easily broken.

Bright red blood flows through the living bones.

Bones are the foundation of our bodily house.

The large bones are for strength.

The neck joins the head and trunk.

The shoulders join the arms to the body.

The spine helps to keep the body erect.

The upper parts of the trunk are the chest, back, backbone, and shoulders.

The lower parts of the trunk are the abdomen, back, and hips.

We have joints in our arms and legs, so that we can bend them.

The three chief joints of the leg are at the hip, knee, and ankle.

The three chief joints of the arm are at the shoulder, elbow, and wrist.

Work and play in the open air and sunshine help to give us rosy cheeks and strong bones.

Poorly fitting boots and shoes are apt to crowd the toes out of place.

Ill-fitting boots and shoes may cause tender feet, corns, and ingrowing nails.

Tobacco may stunt the growth of the bones.

REVIEW QUESTIONS

1. What do you mean by the bony frame of the body?
2. To what may the bones of our body be compared?
3. What useful purposes do bones serve?
4. How many bones are there in the body?
5. When are bones soft and easily bent?
6. At what age are bones hard, brittle, and easily broken?
7. What do you mean by the skeleton?
8. Tell what you can about the bones of the head.
9. What does the skull contain?
10. What is meant by the trunk?
11. What are the ribs?
12. Tell what you can about the backbone.
13. Describe the collar bone.
14. Describe the shoulder blade.
15. What are the bones of the arm?
16. Describe the bones of the leg.
17. How are the bones joined to each other?
18. Show how the bones are tied to each other.
19. Why are some children bow-legged?
20. What may be the effect of tight clothing on the bones?
21. Why should we sit and stand erect in school?
22. Give some hints about wearing boots and shoes.
23. What may cause round shoulders and a curvature of the spine?
24. How may alcoholic liquors injure the growth of the bones?
25. What harm may tobacco do the bones?

LESSON VII

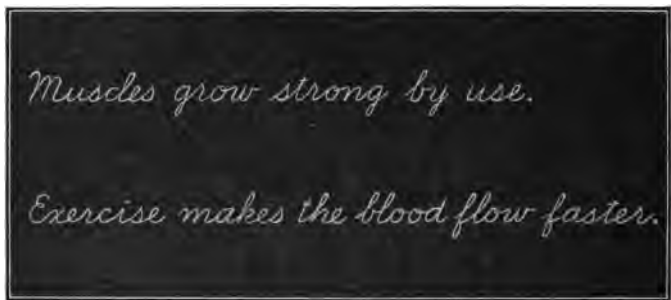
THE MUSCLES: HOW THEY DO THEIR WORK

Why are your arms, your face, and your shoulders so full and plump? Because their bones are covered with flesh. This flesh, or lean meat, is called **muscle**. The muscles clothe the bony framework of the body.

What is a muscle? Simply a bundle of very lean meat, made up of many tiny strings. We have all seen these little strings, or fibers, in cooked meat. The meat of animals is made of muscles. In some animals these are quite red, while in others they are of a light color. The color of beef — the meat of the ox or of the cow — is, as you know, a deep red, while the meat of a turkey or of fish has a lighter color.

Are the muscles of use to us? They are of the greatest use to us. They enable us to move the different parts of the body; it is by means of muscles that we walk from place to place; our arms and legs are moved by muscles; our bones,

our fingers and toes, our mouths, our eyelids, our hearts, — all are moved by muscles; no smile would



BLACKBOARD WORK

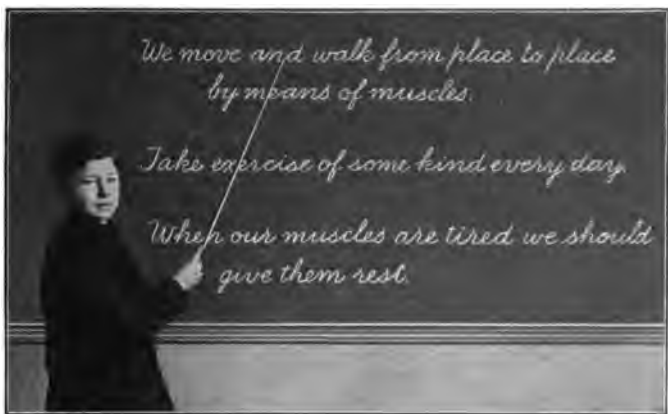
ever pass over our face, nor a drink of water reach our lips, without the help of muscles. How could we get along without them?

Are there many muscles in the body? Nearly five hundred. Each one has its own name and its own special work to do. Do you think that these muscles make up a small or a large part of your body? Indeed, they make up a large part: about half the weight of our bodies is due to muscles.

Muscles are of various sizes and shapes. Some are large, others are very small; some are shaped like fans, others are long and round; many are broad

and flat, and taper at each end. Muscles that move the arms and legs are long ones, while some of the muscles of the ear and eye are almost too small to be seen with the naked eye; that is, muscles vary in size and shape according to their place and the work they are to do.

How do muscles do their work? Let me tell you. Take a piece of India rubber and stretch it with



A LESSON FROM THE BLACKBOARD

your two hands, and you will see that it becomes thinner. When you let it go it snaps back and shortens itself. Now our muscles are very much

like this India rubber: at one moment they are short and thick, and the next they have become longer and thinner; then again they become short and thick. But they are made in such a way that they shorten and lengthen themselves, without being stretched by some one as the India rubber has to be.



TENDONS, OR CORDS,
ON THE BACK OF
THE LEFT HAND

You have seen a boy "try his muscle." Place your right forearm on the desk. Grasp with your left hand the upper part of the right arm. Slowly raise the forearm, but keep the elbow on the desk. As you move your forearm up and down you feel something on the front of the upper arm swell and grow hard. What is it? It is some of the large muscles of your arm at work.

This work is called the **contraction**, or the shortening, of a muscle. All muscles act in this way by contraction, but not all muscles are tied to bones.

Some muscles are fastened directly to the bones; others taper to white cords, or tendons. Perhaps you have seen the butcher hang up a side of beef or a leg of mutton in the market by the tendons. We all know how easily we can feel the tendons in the wrist and behind the knees.

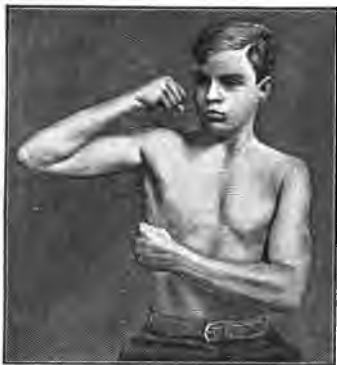


Bend your fingers to and fro, and you can see and feel the cords move on the

SCHOOLGIRL WATCHING THE TENDONS ON BACK OF RIGHT HAND

back of the hand. The tendons, then, are the little ropes with which the muscles in the arm move the fingers. Children at Thanksgiving time often amuse themselves by pulling the white cords in the leg of a turkey, and making the claws move, just as they are moved by this fowl when he is alive.

Why do so many of our muscles taper into these little ropes? It is to save room and allow our limbs to move easily. What large and clumsy hands we



A STRONG SCHOOLBOY

He has used dumb-bells every day and is now engaged in "trying his muscle"

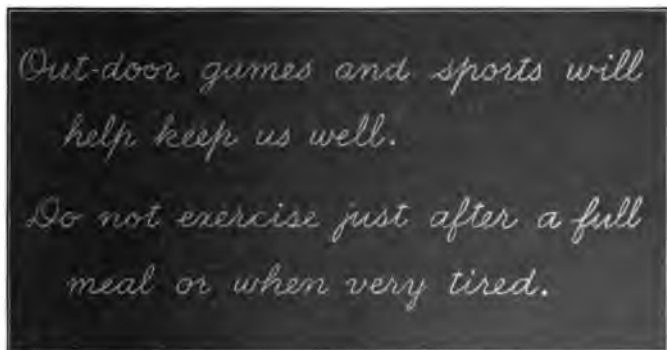
should have if all the muscles needed to move the fingers were in the hand instead of some of them being in the arm! Muscles thus give to the arm that round fullness that makes its shape beautiful.

The tendons by which the toes are moved are arranged in somewhat the same way, for they are the ends of muscles which are in the leg and are fastened near the knee. When these long muscles contract, the tendons draw up the toes. What large feet we should have if all the muscles that move the toes were in the feet instead of in the leg!

LESSON VIII

EXERCISE, AND HOW TO TAKE IT

Did you ever notice what stout, strong arms a blacksmith has? Look at those big muscles that swell out as he brings his hammer down on the anvil! What a hard blow he can strike!



BLACKBOARD WORK

Did you ever break your arm and have to keep it in a sling for several weeks? If so, you found out that it grew thinner and weaker. How will you explain this? Why, simply in this way: If the

muscles are much used, they grow hard and strong; if they are not used, they become smaller and weaker. Constant use, then, instead of wearing out the muscles, makes them larger and stronger.

Is this true of all our muscles?



Certainly. Then walking, running, and jumping not only make our arms, legs, and backs stronger, but also make the blood flow more freely through every part of our bodies. Exercise of this kind makes us breathe in more fresh air, and at the same time we get rid of more waste matter. It makes us warmer, and helps us digest our food.

What a good thing it is for boys and girls that they are so fond of games and play! Rowing, croquet, baseball, football, golf, skating, and coasting,—all these sports will help them grow up into stronger men and women.



COASTING

But, after all, perhaps the best way for children to use their muscles is in doing something useful. Boys can help their fathers on the farm or in the shop, while girls can help their mothers in the house.

Walking outdoors is the best of all exercises for both young and old. It takes us into the fresh, pure air and the bright sunlight. If we take a brisk walk every day we shall never want for healthful exercise.



SKATING

The graceful gymnastic exercises used in many schools may also do much to give strength to the body.

Boys and girls should never play until they are tired. How foolish it seems for girls to jump rope or play basket ball—as we know they sometimes do—until they are faint and ill! Remember that too much or too severe exercise may do much harm instead of good.

LESSON IX

HOW ALCOHOL DOES HARM TO THE MUSCLES

Wherever you have lived, especially if in a city, you have probably seen the unsteady and staggering gait of a person under the influence of strong drink. It is a sad but common sight.

What has happened that the muscles, even of a strong man, if he has been using alcoholic liquor, are so little under his control? Let me tell you.

When the brain is healthy it sends out its orders to the muscles through the tiny white nerves, and then the muscles do as they are told.

But alcohol weakens this nerve power which controls the muscles. They are then less able to do the bidding of the brain. Let a skilled workman drink a certain amount of strong drink. He may know just how each tool should be used, but he will find himself using it in a very bungling manner. The trained muscles become feeble, and are no longer under the control of the will.

Are all the muscles made weak in the same way? Certainly; though some drinks weaken them more than others. Any drink that has alcohol in it is hurtful to the muscles.

We speak by means of the muscles of the tongue and throat. The control of these muscles is soon weakened by alcohol. Hence the drunken man talks thick, leaves out words, cuts them short, or puts them in the wrong place.

Tobacco also weakens the control of the muscles. No one who wants muscles that will obey his brain should use strong drink or tobacco.

WRITING EXERCISES

We move and walk from place to place by means of muscles.

There are in all about five hundred muscles in the body.

Muscle is lean meat, or the flesh which covers the bony framework.

No part of our body can move without muscles.

Muscles are of many different sizes and shapes.

Each muscle has its own work to do.

Muscles do their work by becoming shorter and thicker.

Many muscles are fastened directly to bones.

Other muscles taper into tough white cords called tendons.

By bending the fingers to and fro we may feel these cords just beneath the skin.

Tendons save a great deal of space and allow very free movements.

Many muscles when they move pull the bones toward each other.

Work and play in the open air make our muscles larger and stronger.

When our muscles are tired we should give them rest.

After a long walk we should sit still and read for a short time.

After sitting or reading a long time, take a walk or play in the open air.

Take exercise of some kind every day.

Outdoor games and play will help to keep us well and strong.

While walking in the open air we should practice deep breathing.

Do not exercise just after a full meal or when very tired.

REVIEW QUESTIONS

1. What is a muscle?
2. Of what is the meat of animals made?
3. Of what color are muscles?
4. What do muscles enable us to do?
5. How many muscles are there in the body?
6. Do muscles make up a small or a large part of your body?
7. Does each muscle have its own name and its own work to do?
8. What are some large and some very small muscles that you can mention?
9. How do the size and shape of muscles vary?
10. What peculiar power do muscles have?
11. Illustrate this power of contraction by a piece of India rubber.
12. What do you mean by "trying muscle"?
13. How will you try your own muscle?
14. Why do the muscles taper into slender cords?
15. How may you show how tendons act on your own person?
16. What is the effect of use on the muscles?
17. Why do we need exercise?
18. What are some of the good results of exercise?
19. What are some of the more common kinds of exercise that children like?
20. Why is walking the best kind of exercise?
21. What is the effect of alcohol on the muscles?
22. How may tobacco affect the muscles?

LESSON X

A FEW FACTS ABOUT ALCOHOLIC LIQUORS

We have just told you that alcoholic liquors injure the growth of the muscles. The evil nature of these drinks is due to the alcohol which they contain.

Alcohol is a poison. A little poison may injure health; more than a little may destroy life. Chil-

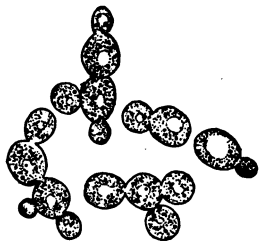


BLACKBOARD WORK

dren, and some grown people, have been suddenly killed by drinking liquors that contained much alcohol; but more people have been injured, and more lives have been shortened by the use of alcohol in drinks which did not kill at once.

Alcohol is not found anywhere in nature, as we find water in springs and rivers. Where, then, does it come from?

When the juice of apples is squeezed out it is sweet. We call it sweet cider. This new cider, when



WILD YEAST PLANTS, OR
FERMENTS

Ferments are found in the juice of apples, and they cause the fermentation of cider

it has stood in warm air for a short time, begins to "work," or ferment as it is called. What causes it to do this? Some very tiny things called **ferments**.

Now you must know that ferments are much smaller than anything you have ever seen with your naked eye. They float around in the air like dust, but they are smaller than the finest speck of dust you ever saw floating in a ray of sunshine.

Ferments are also on the skins and stems of apples. They cannot get inside while the skin is unbroken, but when the apples are ground up to make cider these ferments, and others from the air, get into the juice that is pressed out. You will

probably say, "If they are so very small, what harm can they do?" A great deal. They change a good fruit juice into an unwholesome drink. Let us see how they do this.

The juice that comes from apples is sweet, because sugar was formed in it while the apples were growing and ripening. When the juice is squeezed out the ferments cause this sugar in it to decay, or to go to pieces, and two other substances take its place.

One is a gas that you can see bubbling up out of the juice after it has stood a few hours; the other is alcohol, that remains in the juice, and may make the cider a dangerous drink.

Now it is the nature of alcohol to make those who drink any liquor containing it want more and more. This is one reason why wine, whisky, and brandy are such dangerous drinks.

You can drink milk without fear that it will make you want to drink milk all the time; but no one can tell, when he begins to drink alcoholic liquors, how soon he may have such a craving for them that it will be almost impossible for him to let them alone.

When the juice is pressed out of an apple and allowed to stand, its odor, taste and color soon become changed.

The apple juice is changed into cider by the action of ferments.

Ferments are tiny plants which can change sweet apple juice into a gas and alcohol.

The gas bubbles out of the juice; the alcohol stays in it.

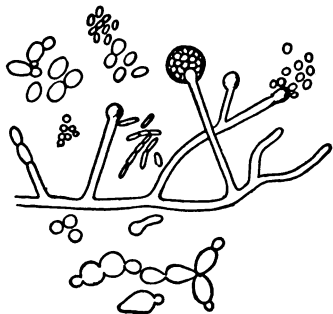
BLACKBOARD WORK

LESSON XI

MORE ABOUT ALCOHOLIC LIQUORS

The juice of grapes is often pressed out to make wine. Ferments are on the skins of grapes and other fruits as well as on apples. When the grape juice is pressed out the ferments get into it and quickly begin to change the sugar to alcohol.

Grapes, as you know, are good for us to eat, and their juice when first pressed out is good for us to drink; but when it has stood a few hours in warm air, and the ferments have begun to change its sugar to alcohol, it is no longer healthful, but dangerous. It is the nature of the alcohol in this wine to make any one who drinks it form such a liking for it that he may become a drunkard.



WILD YEAST PLANTS, OR
FERMENTS

Ferments are found upon the skin of grapes and are concerned in the fermentation of wine

The free use of wine has led to the habit of drinking the stronger liquors.

The juice of currants, raspberries, elderberries, and other fruits is sometimes pressed out to make what are called homemade wines; but if these juices are allowed to ferment they will contain alcohol, and should never be drunk.

Liquors containing alcohol may be made from dry grains. Grain contains starch. By moistening the grain, and keeping it warm, the brewer can make his starch turn to sugar. He then grinds the grain, and puts it in water to soak out the sugar. To make this sweet liquor ferment, the brewer puts in yeast, which contains ferments much like those on fruit and in the air.

These ferments change the sugar in the sweet grain liquid to alcohol and gas. The gas bubbles out into the air, and the alcohol remains in the liquid. The drink made in this way is called beer. The alcohol in beer has the power to make the one who drinks it keep wanting more and more beer, until beer no longer satisfies him, and he will often want drinks that have more alcohol in them.

Beer, wine, or cider will not make a boy manly. They will not help him in his study, work, or play, but may make him dull and stupid, and careless about doing right. They may make a drunkard of him. No boy can afford to be made stupid or bad, or to run any risk of becoming a drunkard.

Beer is sometimes made at home by steeping roots and herbs, and causing them to ferment by adding yeast. Let no one think that such home-made beer is harmless, for it is not. Any sweet liquid made to ferment by means of yeast will contain alcohol, and any liquor that contains alcohol may have the power to do harm by injuring the health and by creating the craving for alcohol that may lead in time to drunkenness.

Alcoholic liquors may become real poisons both to the mind and to the body. They do more harm than war, pestilence, and famine. In other lessons you will be told more about them.

In the meantime, here is a golden text for you to remember all the days of your life:

NEVER DRINK A DROP OF ALCOHOLIC LIQUOR!

Golden Texts:

"Do not drink wine nor strong drink."—Leviticus x. 9.

"Look not thou upon the wine when it is red."—Proverbs xxiii. 31.

"Woe unto them that rise up early in the morning, that they may follow strong drink."—Isaiah v. 11.

"For the drunkard and the glutton shall come to poverty."—Proverbs xxiii. 21.

BLACKBOARD WORK

WRITING EXERCISES

Alcohol is a poison to the body.

The alcohol in strong drink may do us much harm.

Strong drink may make us want more of it.

Strong drink may make us say bad words and do bad things.

Strong drink keeps people from doing good work.

Strong drink does more harm than war, pestilence, and famine.

Strong drink may become a poison both to the mind and to the body.

Wheat, rye, rice, and other grains are good to eat.

They do good to the body and keep it well and strong.

The grains that make good food are sometimes made into strong drinks.

These strong drinks contain alcohol, and alcohol is a poison.

All plants are not good for food.

Tobacco is almost sure to do harm to any one who smokes or chews it.

Tobacco does no good, but may do much harm to the body.

Tobacco may stunt the growth of our bodies.

Tobacco often dulls the brain.

Tobacco may make us a slave to a bad habit.

Tobacco smoke makes the air impure.

We should not breathe air filled with tobacco smoke.

To smoke or chew tobacco is a selfish, unclean habit.

Cigarettes may make a boy dull and stupid.

A golden text for us all to remember: Never drink a drop of strong drink!

REVIEW QUESTIONS

1. What is alcohol?
2. What will a little poison do to the health? What will more do?
3. Has any one ever been suddenly killed by drinking alcoholic liquors?
4. What can you say of those who have been injured, but not suddenly killed, by these liquors?
5. Where do we find the water which nature prepares for us to drink?
6. Do we find alcohol thus prepared for us by nature?
7. What is the juice of apples called when squeezed out?
8. What does new cider do when it has stood in warm air for a short time?
9. What causes it to do this? Describe ferments.
10. Where are ferments found?
11. When do they get into apple juice?
12. What do ferments do to good fruit juice?
13. Why is the juice of apples sweet?
14. What do ferments do to the sugar in apple juice?
15. What two new substances take the place of the sugar?
16. What becomes of the gas? What becomes of the alcohol?
17. Why, then, is cider a poisonous drink?
18. What is it the nature of alcohol to do to those who drink any liquor containing it?
19. Why is it more dangerous to drink liquors that have a little alcohol in them than to drink milk?

20. For what purpose is the juice of grapes sometimes pressed out?

21. What gets into grape juice when it is pressed out? What do they do?

22. What can you say of grapes and of grape juice when it is first pressed out?

23. What change do the ferments make in sweet grape juice?

24. What liquors may be made from dry grain? What does grain contain?

25. How does the brewer turn the starch of grain to sugar?

26. How does he get a sweet liquor from the grain when he has ground it?

27. How does he make this sweet liquid ferment?

28. What do these ferments do to the sugar in the sweet grain liquid?

29. What can you say of the gas thus formed? What of the alcohol?

30. What name is given to the drink made in this way?

31. When beer no longer satisfies the drinker, what kind of drink does he want?

32. Will alcoholic drinks make a boy manly? Will they help him in his study, or work, or play?

33. What will they do for him? Why can no boy afford to drink them?

34. What can you say of any liquor that contains alcohol?

35. What can you say of the harm done by alcoholic liquors?

36. What is a golden text for us all to remember?

LESSON XII

WHY WE NEED TO EAT

Did you ever think that our bodies are somewhat like a steam engine? Well, they are. We move about, and are warm, because a fire is always burning inside of us. This fire, like that of the engine, needs fresh fuel, or it will go out. Where does this fuel come from? Why, it is supplied from the food we eat.

The different parts of an engine are, as you know, all the time wearing out. So it is with our bodies: we are all the time wearing out. Every step we take, every word we speak, every wink of the eyes wastes a little bit of our bodies.

Our bodies, or at least some part of them, are always in motion. We know perfectly well that in order to walk, jump, or talk, we must move our limbs and use our muscles; but even when we think we are motionless—when our heads, hands, and feet are still—the muscles of the heart and

lungs are working constantly with every breath we draw. Even when we are asleep they are not at rest.



A LESSON FROM THE BLACKBOARD

Then why don't we waste away? Well, we should if we did not do something else besides working and wearing away. You ate your dinner yesterday, didn't you? and your breakfast this morning? Certainly.

This is the whole story. What we eat and drink takes the place of what is used up by the body in working for us.

Can you see that the food you eat looks at all like your bones and flesh of which it is to make a part? No, indeed. Perhaps you think the meat is somewhat like it; but how about potatoes, corn, butter, and eggs?

How are all these things carried to every part of the body, and changed into bones, flesh, and hair? Four words will tell you the secret. *The blood carries them.* We shall read in another lesson that the blood brings away waste matter *from* every nook and corner of our bodies, and that it also carries fresh nourishment *to* every part of them.

LESSON XIII

THE FLESH-MAKING FOODS

What a great many different things we eat and drink! Is this good for us, or not? Yes, it is good for us, as we shall soon see. We can easily put all the food that is good for us into three great classes.

First, we must eat certain kinds of food to make up for the waste of which you have just been told. You would like, wouldn't you, strong muscles in your legs, so that you could run or walk a long way without getting tired? You would, of course, like strong muscles in your arms, legs, and back, so that you could easily lift a heavy weight, play baseball, or work hard in weeding the garden.

What will give you these strong muscles, and many more things too? Why, these same flesh-making foods. And why will they do it? Because they all contain a whitish substance called *albumen*. Think of the white of an egg, and then of albumen. They are really about the same thing.

All the really living parts of the body are chiefly made of this same whitish substance known as albumen. So, then, you may well suppose that these vital parts must have a fresh supply, or they will wither and die.

What are some of these flesh-making foods that we should eat every day? Lean meat, and bread are rich in albumen; and so are eggs, peas, beans, and milk.

Wheat, barley, oats, rice, and corn also contain albumen. All these foods contain something which our muscles and blood especially need, and which our bodies are using up and getting rid of every moment of our lives. Hence, to make good this loss, we must eat flesh-making foods, or else we shall slowly starve to death.

LESSON XIV

THE HEAT-GIVING FOODS

We have just read about foods which help to make new flesh and new bone; but we need to eat other food to keep us warm and to enable us to do work. All sorts of foods that have sugar, starch, and fat in them will do this for us. These heat-giving foods are the second class of foods which are good for us.

You may think, perhaps, that all of our sugar must be bought at the grocer's; but this is not so. There is a little sugar in flour, but much more in peas, oatmeal, beets, honey, milk, and in most of the fruits.

You did n't think that we ate starch, did you? What is starch made from? From flour and potatoes. So, when we eat flour and potatoes, we eat the starch that is in them.

Common starch is of little use as food until it has reached the stomach and been acted upon by certain

fluids called the digestive juices, and then changed by them into sugar.

The saliva of the mouth thus acts upon starch. A piece of bread, as you know, tastes sweeter after it has been in the mouth a short time.

Some people, especially children, do not like the taste of fatty meat and butter. Why do we need these fatty foods? Because they furnish heat to our bodies. You know how brightly and quickly fatty things burn when set on fire. Well, they burn somewhat the same in the body, only much more slowly, and they do not give out flame or light.

Shouldn't you think that people who live in cold countries would need a great deal of fatty food? Well, they do. The little Eskimo children will eat a tallow candle with as keen a relish as you would have for bananas or ice cream.

Once upon a time some English sailors made a Christmas tree for some Eskimo children by tying together walrus bones and hanging on them balls of whale blubber instead of bonbons. This was a rare treat for the boys and girls, who ate the balls of fat as eagerly as you would eat chocolate creams.

LESSON XV

THE SALTY FOODS

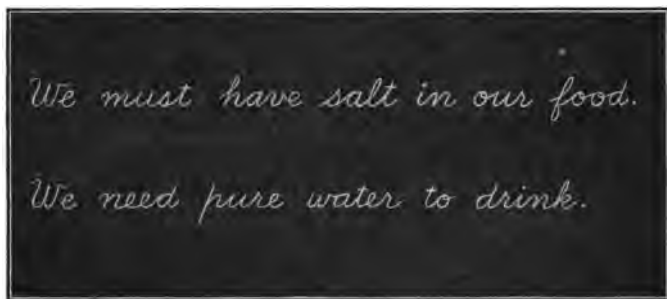
We have just read about certain foods which belong to animal and vegetable life. These flesh-making and heat-giving foods make up two of the kinds of food that our bodies must have. Besides these we must eat certain things which never had any life. We cannot always see them or taste them in our food, but we need to eat them every day. We may call these the salty foods.

We could not get along at all without common salt. We read of men who have risked their lives to get even a taste of it. Many years ago wicked men used to torture prisoners by giving them only bread to eat, and that made without salt. Cakes of salt have even been used as money.

The lower animals like it, too. You have probably seen farmers put salt in the pasture for the cows and sheep to eat. Wild animals will travel miles across the plains to reach the salt licks, which

are usually swampy patches of ground where the pools of water and the top of the earth are covered with salt.

We read in the books that the early settlers of Kentucky used to follow the well-beaten trails made by thousands of buffaloes as they tramped to and



BLACKBOARD WORK

fro for many years through the vast wilderness to the salt licks.

How much salt do you suppose we have in our bodies? Almost half a pound; but we are all the time losing it. We find salt in the sweat, and we know that tears are salty. You must not think that you do not eat any salt because you do not eat it clear. Many of the foods we eat have just a little salt.

Besides common salt, we need other kinds of salt to help purify the blood. These we get from certain vegetables and fruits.

Years ago sailors who were forced to go on long voyages without fresh vegetables often died from a dread disease called *scurvy*. Now that vessels are able to carry various canned and bottled goods the disease is less common.

Growing children also need other salts to make their bones harder and stronger. These salts we find in bread, cereals, and milk. This is one reason why children should eat plenty of bread and milk. Would you believe that you need any iron in your food? Well, you do, for iron helps to make good blood for you, and blood of a bright red color. Doctors, as you know, often give various kinds of iron as a medicine to feeble people to make them stronger.

LESSON XVI

THE WATER WE DRINK

You will be surprised to learn that our bodies are largely made up of water, and that even the teeth have water in them. How much do you weigh? Suppose it is seventy-five pounds: well, nearly sixty of these pounds are water.

We are all the time getting rid of water through the skin, the lungs, and the kidneys. The sweat is oozing through the skin all the time, and we breathe out watery vapor from the lungs. When you are older you will read from some larger book about the work of the kidneys.

How shall we make up this loss? Why, we must take water into the stomach every day, both as food and as drink. When we are real thirsty nothing is so good as cool, fresh water from a spring or a deep well. Besides what we drink, there is a great deal of water in many things we eat, — as fish, potatoes, lean meat, apples, and all the fruits. Water

alone will keep us alive for a time if nothing else can be had.

Many years ago a man succeeded in living forty days without taking any other food or drink than water. The story is told of a miner who lived twenty-three days in a coal mine without swallowing anything but water sucked through a straw.

How necessary it is to have the water we drink pure and wholesome! What a blessing it is that pure water is so plentiful! Deep wells and springs of good fresh water are found in almost every village.

Dreadful sicknesses are sometimes caused by drinking impure water. Sometimes the people of a whole village have been poisoned by drinking water into which some drain has leaked, or into which some poisonous matter has filtered through the soil. People are now more careful than they used to be about the water they drink.

LESSON XVII

UNWHOLESOME DRINKS

Should you not think that people would be satisfied with pure cold water to drink? Are they not? Not at all. More than this, is it not strange that people should want drinks that are certain to do them a great deal of harm?

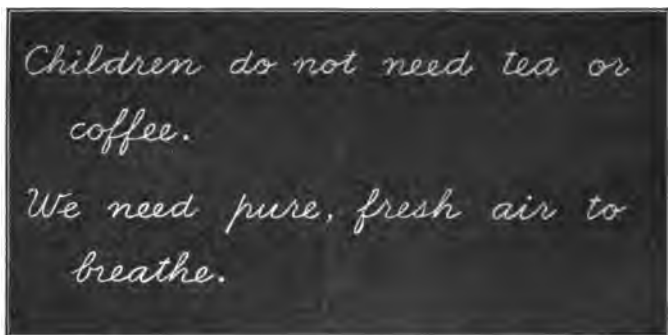
Unwholesome drink can do us even more harm than unwholesome food. Too much or too little food, or food of the wrong kind, may make people peevish and cross; but strong drink has the power to make them ill, ugly, and wicked.

The greater part of almost every drink is water; but, in various ways, other things are often mixed with it to give a pleasant taste. Such mixed drinks have long been used by all kinds of people. Of course some drinks are far more hurtful than others.

In hot weather many people drink soda water, lemonade, and other similar beverages which do not specially injure the health.

How about tea and coffee? They do little or nothing to nourish the body, so we cannot call them real foods; but many people drink them, as you know.

Remember this,—that tea and coffee are stimulating drinks, just as pepper sauce and pickles are



BLACKBOARD WORK

stimulating foods. All such foods and drinks may do much harm and very little good.

Many people cannot drink tea or coffee without being the worse for it. In many cases these drinks cause sick headache and dizziness.

Are tea and coffee good for children? Not in the least. Pure water and good milk are all they really need.

How often do we see people, overheated and overtired, drink glass after glass of ice water! It is a foolish habit, and often leads to serious results. Sooner or later, ice water is apt to weaken the strongest stomach. It quenches thirst only for a moment. If you must drink it, sip a little very slowly.

All of us have seen, especially during hot weather, the various kinds of popular drinks which are exposed for sale. They are usually made of water flavored with fruit sirups, roots, and herbs, and slightly "charged" with a gas. They are commonly known as soda water, root beer, ginger ale, and by many fanciful names. These drinks are refreshing, and when used with good sense have no ill effects.

As you already know, the most unwholesome drinks are alcoholic liquors. In other lessons you may read more about the harm they do to the body.

LESSON XVIII

TOBACCO, AND THE HARM IT DOES

Would you believe that thousands of people smoke and chew that which they know to be a poison? And yet they do. They know that it is hurtful; but tobacco has the power of making those who use it like it so well that it is almost impossible to leave it alone.

You have no need to be told what it is that so many people smoke and chew. Wherever we go we are almost sure to smell the odor of tobacco.

Why is tobacco a poison? Because it has in it *nicotine*, one of the most deadly poisons known. A single drop of it has killed a full-grown cat in one minute. A tea made of tobacco, and put on the skin, has caused death in three hours.

Soldiers have been known to shirk military duty by making themselves sick with a poultice of tobacco, which they had put under the arm or over the stomach.

You must know, then, that it is hurtful to the health to smoke or chew tobacco. What harm does tobacco do? Sooner or later it makes the heart beat faster, brings on certain kinds of indigestion, and irritates the throat and lungs.

Its effect upon the nerves and the brain is plainly evident. The poison of the tobacco deadens their delicate parts. The old tobacco user is often cross, peevish, and liable to fits of anger.

Tobacco has an injurious effect upon young people: it stunts the growth of the body and weakens the mind. No one should laugh at the pitiable sight of a boy made sick by his first smoke; there is nothing to laugh at. It is really the effect of a poison upon the delicate brain and nerves.

Even after young people get used to tobacco they often suffer from indigestion, headache, loss of appetite, and a trembling of the muscles.

Let me tell you the whole story in a few words: No boy should ever use tobacco if he wishes to keep well and is anxious to succeed in life.

Do you wish to keep your mind active and alive to all that is good and useful? Do you wish

to have clear ideas of things, and a vigorous will power? Certainly you do. Well, then, let tobacco in every form severely alone! It will dull your wits, impair your power to think, and weaken your memory.

God has given us good health as a precious gift. We cannot be too grateful for it. How weak and foolish it is to be chained to any unwholesome habit, like that of smoking and chewing tobacco, which often spoils this great blessing!

LESSON XIX

A FEW WORDS ABOUT CIGARETTES

Let us learn a few things about cigarettes, and the harm they do to young people.

The trade in cigarettes has grown to an enormous extent in recent years. They are made and sold by the million. Thousands of boys at this very moment are using tobacco in the form of cigarettes. All that money can do is done to entice young people to smoke them. Advertising schemes, which appeal to what is bad in us, help increase this harmful trade.

Of what are cigarettes made? Let me tell you. The poorest kind of tobacco is often used, and this is sometimes mixed with harmful drugs in order to give some bulk and flavor to the cheap and filthy stuff. Do you wonder that many of the states have passed laws against selling cigarettes to boys?

You will not be surprised, then, to learn that the smoking of cigarettes works a great deal of harm

to the health of young people. It may injure many of the most important parts of the body. The smoke is apt to irritate the lining of the throat and lungs, and may cause a sore throat and a hacking cough. It weakens the stomach so that the food is not properly digested, and in time dyspepsia may result.

Did you ever have your heart go pitapat, or beat very fast when you were startled? This is called **palpitation**. Well, cigarette smoke often makes the heart beat like this, because the busy little engine is weakened by the poison.

There are other ills which cigarette smokers suffer from, such as loss of appetite, irritable temper, headache, dizziness, and general weakness.

It would take all of this book to tell you the whole story of the evil that may come to those who use cigarettes. We hear a great deal about the deadly poison of sewer gas, but it would be less dangerous for a boy to learn his lesson in geography over a manhole of a sewer than to get into the habit of smoking cigarettes.

WRITING EXERCISES.

Our bodies are somewhat like engines.

We move about and are warm.

A fire is always burning inside our bodies.

This fire will go out without fresh fuel.

Our bodies are wearing out all the time.

We are all the time wearing out because we are using our bodies all the time.

We need plenty of good food to keep our bodies in repair.

Everything we do and say wears out some part of our bodies.

Every living thing needs food of some sort.

Food helps to keep us alive and make us grow.

Food helps to keep us warm.

We must not eat between meals.

We should eat plain, simple food.

We should drink only pure water.

Deep wells and springs furnish good pure water.

Pure and wholesome water is a great blessing.

Every part of our bodies needs water.

Water is the best drink for us all.

We must have salt in our food.

Tea and coffee are not good for children.

Alcohol and tobacco are not foods.

Tobacco contains nicotine, a deadly poison.

Alcohol and tobacco are bad for the stomach.

Cigarette smoking may do the body a great deal of harm.

Good health is a precious gift.

REVIEW QUESTIONS

1. How would you compare the body to a steam engine?
2. Why do we need to eat food?
3. What is meant by the 'flesh-making' foods?
4. Give some familiar examples.
5. Tell something about the sugars and starches.
6. From what do we get starch and sugar for food?
7. Why do we need fatty foods?
8. How do we get our supply of fat for food?
9. What is the value of the salty foods?
10. What can you tell about the use of common salt as a food?
11. Do we need other kinds of salt as food?
12. How do we get our supply of salt?
13. Of what is the body largely made up?
14. Why do we need water as a food?
15. What is the effect of using impure water?
16. What can you say about the use of tea and coffee?
17. What can you say about the use of ice water and other drinks?
18. Describe the hurtful effects of alcoholic liquor.
19. Show how tobacco acts like a poison.
20. What is meant by nicotine and what harm may it do?
21. What harm does tobacco do?
22. Describe its injurious effects upon young people.
23. What harmful things are often used in the making of cigarettes?
24. How do cigarettes injure the health?

LESSON XX

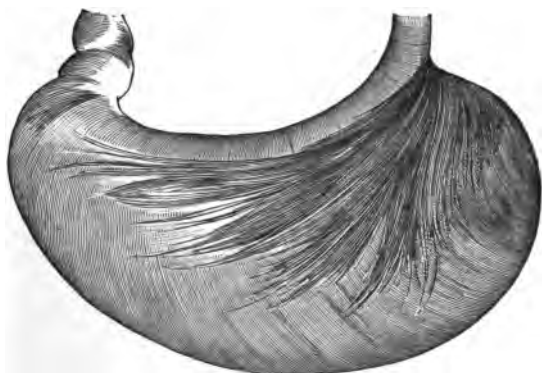
HOW WE DIGEST OUR FOOD

Can anything be more wonderful than the fact that the things we eat—the meat and potatoes, bread and water, and other things that have no life in themselves—should be changed into living bone, living flesh, and living skin? Indeed, it is something marvelous. You may well imagine that the food must be changed a great deal before it can become part of the blood.

How does the food get into the blood at all? How is it ever made fit to mix with the blood? Let us learn a few of the simplest things about this strange process.

In the first place, the food is cut into little pieces by the **teeth**,—useful little jewels, of which the jaws are the jewel cases. Then it is rolled around by the tongue, pressed against the roof of the mouth, and well moistened with saliva, which prepares it to be swallowed.

When we swallow food it passes down the food pipe into the **stomach**. This is a pear-shaped bag, capable of holding about three pints. As soon as the food is swallowed the stomach begins to move with a waving motion that carries the food round and round as if it were being churned.



THE STOMACH

A fluid, called the **gastric juice**, is poured out of thousands of tiny holes in the walls of the stomach. This fluid dissolves and helps digest certain portions of the food, as lean meat, milk, eggs, and some parts of bread.

The walls of the stomach are also full of blood vessels. After a time some of the partly digested

food makes its way through the outer walls of these blood vessels, and then through the thin lining, and thus passes at once into the blood itself.

We can thus see that the stomach is a very busy workshop. If you could look into your stomach and see all the astonishing things going on inside, it would be far more interesting to you than watching the bees through the glass windows of their hives, as they make honey.

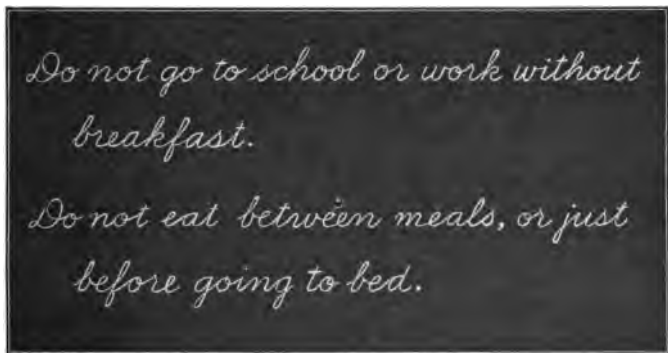
The rest of the food passes out into the small intestine, often called the bowels. This is a tube about twenty-five feet long, but it is so folded and coiled that it takes up but little room. Now the food, mixed with and acted upon by other curious juices, is pushed slowly onward through this long tube. The nutritious part, little by little, soaks through the very thin walls of the bowels into the blood vessels, and mixes with the blood.

Then the blood carries it everywhere. Each part of the body — the bones, muscles, skin, hair, and so on — takes out what it wants.

LESSON XXI

WHY WE SHOULD EAT WHOLESOME FOOD

What kind of food should we eat? What food will do us the most good? Why, that which can be easily changed by the digestive juices into those things fit to mix with the blood.



BLACKBOARD WORK

Suppose you should try to make your horse or your cow live on meat. It would not nourish or keep either of them alive, any more than grass or oats would nourish boys and girls or keep them alive.

It is only that which each can digest that will make either the animal or the human being well and strong.

We can tell pretty well what agrees with the stomach. If we feel uncomfortable after a meal, instead of comfortable, it is very probable that we have eaten some unwholesome food, or eaten too fast or too much. If it takes us a long time to get asleep; if we have bad dreams, or wake in the morning with a headache, and have no appetite for breakfast, it is often because we ate some unwholesome food on the day before.

Children will often be fretful and cross because their food does not digest well. If you wish to feel well and hearty, do not eat anything but wholesome food. Some people seem to think that even if they tease their stomachs and get them out of order, they can make them well again by taking medicine; so they keep on eating things that hurt them, and then take medicine to mend the mischief.

It is better not to have to take medicine at all, but to try in other ways—such as eating good food, with care, and taking proper exercise—to have the stomach and bowels do their duty well.

LESSON XXII

SOME OF THE PROPER THINGS TO EAT

What are some of the most wholesome things to eat? Let me tell you of a few. Of course every one eats bread, without which we should be poorly off. There is no single food in the world which meets so many of the real needs of the body. Wheat flour contains everything that is needed to keep us well except fat. When we eat bread and butter and drink good milk we are eating an almost perfect food.

There is one thing which serves for both food and drink. It not only keeps us from wasting away but we grow healthier and fatter on it. What is it? It is milk.

You know that a little baby can live on milk for months, and is all the better if he gets nothing else. Well, when you come to know about it, you will see that milk is in itself several kinds of food. It has something like lean meat in it, and also fat and

some salt. How sweet milk is! This is because it has in it a great deal of sugar. It is indeed a model food.

What a wonderful thing an egg is! It has a great deal of food packed away in the smallest possible space, and is easily digested.

Almost every boy and girl likes meat. This food is simply the muscles of different animals. There are various kinds of meat, as beef, mutton, pork, lamb, and veal. They are easily digested, except, perhaps, veal and pork.

Fish and poultry are excellent articles of food, and are readily digested. Sugar is wholesome, and we need it; but children will often eat too much sugar, just as they will eat too little fat. Much sickness is caused by eating candy, even when it is of the best kind, and a great deal of confectionery is sold which is hurtful.

There is plenty of sugar in ripe fruits, like apples, peaches, pears, melons, grapes, and oranges. No wonder everybody likes fruit; it is generally sweet, has an agreeable flavor, and tends to give us a good appetite.

LESSON XXIII

SOME HINTS ABOUT EATING

To keep well we should have a keen appetite for wholesome food. The plainest and simplest food is the best. Children who are all the time eating rich cake and pies do not care for plain food. When we are hungry we are usually glad to get simple, coarse food. When we stop being hungry and no longer enjoy our food it is a sign that we have had enough. After that, if we go on eating, it may do us harm instead of good.

Dainties will only coax us to eat more than we really need. It is a good rule to eat but little candy and only what is pure. We should eat sparingly of rich pastry, hot bread, rich cake, and other food so often injurious to young and growing children. How much better it would be for us to make a meal of oatmeal and milk, baked apples, a soft-boiled egg, stale bread, or any other kind of simple, coarse food.

After you have studied hard, or played some lively game, you like to rest, don't you? Certainly. Now your stomach also, after it has worked hard to digest what you have eaten, should have a rest; don't rob



A LESSON FROM THE BLACKBOARD

it of its needed rest by eating between meals. Eat only three times a day, and nothing but good, well-cooked food. We should eat our meals with the regularity of a clock. Never skip a meal if you can help it. What a foolish habit it is to go to school or to play in the morning without eating any breakfast!

It is sure to end in indigestion. We should not get into the habit of eating just before going to bed; it may cause us uneasy sleep, bad dreams, and perhaps an attack of indigestion.

We should not eat when we are very tired. Rest, if only for ten minutes, before eating a full meal. Sit down quietly, or read a few moments, before you eat your dinner. After a hearty meal, rest a little while before you play hard or study your lessons.

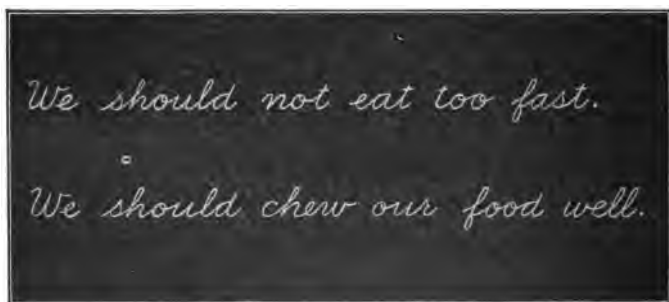
People who eat fast, and swallow their food nearly whole, are very unwise. Of course food so eaten does not digest properly. Remember, then, to eat slowly, and chew your food till it is in fine pieces, so that the juices of the mouth and stomach can do their part in aiding the digestion.

Do not drink anything while the mouth is full of food, for food is digested much better when it is wet with saliva. Keep on chewing your food until the saliva has had time to moisten it.

Is it a good plan to drink much while eating? Certainly not. A drink of ice water or of very cold well water chills the stomach, and digestion is stopped for the time. Do not take food or drink too

hot or too cold; it is apt to stop digestion. We should not drink freely of very cold water when the body is heated. Sit down and cool off for a few minutes, and even then drink sparingly.

If you are overheated do not drink ice water, but cool off by putting your hands into cold water or



BLACKBOARD WORK

by allowing cold water from the faucet to drip on to your wrists.

If we wish to digest our food well, we must not fuss or worry while eating. You know they say that hunger is a good sauce; so also are a jolly laugh and a merry joke. Therefore be cheerful and happy while you are eating. Remember that good cheer will always help you digest your food.

LESSON XXIV

HOW ALCOHOLIC DRINKS INJURE DIGESTION

The stomach is very quick to make known its likes and dislikes. You know well enough what happens when you have eaten unripe fruit, or perhaps swallowed your dinner in a great hurry. You may suffer pain in your stomach for your carelessness.

Now this same busy stomach has no liking for the alcohol which is in all kinds of strong drink. Just as your eye will smart and become red if something gets into it which does not belong there, so the stomach is made red and inflamed by alcoholic liquors.

Besides, strong drink lessens the power of the juice of the stomach to digest food. So you see alcohol may hinder the real work of the stomach, which is, of course, to help digest food. In brief, beer, wine, hard cider, and other alcoholic drinks often cause indigestion.

In the morning the dram drinker has little appetite. He feels that he must have a drink of liquor before he goes to work. After bracing up his stomach, as he calls it, he thinks he will feel more like eating. If he does eat, there is often a dull, heavy feeling in the stomach. No wonder the hard drinker so often suffers from distressing forms of indigestion.

Now all parts of the body work together for the good of each other; so we must not forget that when the stomach is unable to digest food properly many other parts of the body suffer as a result.

WRITING EXERCISES

Very rich food is not good for the body.

The plainest and simplest food is the best of all to keep us well and strong.

Do not tire the stomach by eating between meals.

Never skip a meal if it can be helped.

Never eat a full meal just before going to bed.

We should not eat when we are very tired.

Take a good rest before eating a full meal.

Eat slowly and chew the food well.

Do not drink much while eating.

Food too hot or too cold is apt to stop digestion.

We must not drink freely of very cold water when we are overheated.

Sudden fear or joy may take away the appetite at once and stop digestion.

If we eat too much, or too fast, we are apt to feel dull and stupid for a time.

An overloaded stomach often brings on a sick headache.

Eating too much rich food may cause pimples on the face and an unpleasant odor to the breath.

Cleanse the teeth with a soft brush and warm water after each meal.

Do not crack nuts, crush hard candy, or bite off thread with the teeth.

Picking the teeth with pins and needles will often do harm.

Use the greatest care in saving the teeth.

REVIEW QUESTIONS

1. What do you mean by the digestion of food?
2. What takes place in the mouth during digestion?
3. What is saliva?
4. How does saliva help in the digestion of food?
5. How do the teeth help in digestion?
6. To what may you compare the teeth?
7. Tell what you can about the stomach.
8. Why may the stomach be called a busy workshop?
9. What is gastric juice?
10. What is meant by the intestine or bowels?
11. How are certain parts of the food absorbed or taken into the blood?
12. What kind of food will do us the most good?
13. What is the effect of eating unwholesome food?
14. What may cause loss of sleep and bad dreams?
15. What may make a boy or girl cross and fretful?
16. What will you say of bread as a food? of milk?
17. Mention some other wholesome things to eat.
18. In what foods do we get sugar to eat?
19. What may result from eating too much sugar?
20. Show how the plainest and simplest food is the best.
21. Why should we eat our meals regularly?
22. Why should we rest both before and after eating a full meal?
23. Why is it unhealthy to drink very cold water while eating?
24. Give some other hints about eating.
25. Describe the effect of alcoholic liquors on the stomach.

LESSON XXV

THE BLOOD,—THE RIVER OF LIFE

When you prick your finger with a needle and the blood runs out it looks like a red fluid, doesn't it? Do you know why the blood looks red? Well, let me tell you.

If you could take a peep at a drop of blood through a strong microscope, it would look very much like water, with little red bodies whisking round in it like tiny red fishes in the rapids of a river. There are so many of them that they make the blood look red.

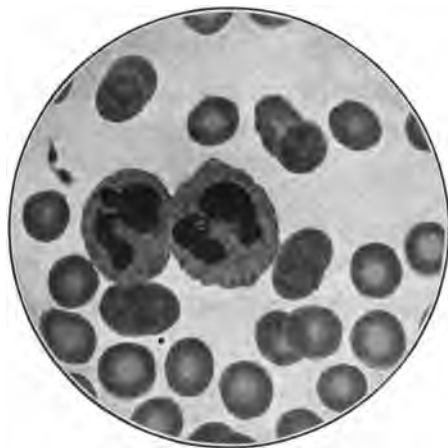
These little bodies are shaped somewhat like thin round cakes or biscuits. They are so tiny that if you had fingers small enough you could put many thousands of them on the head of a pin.

You may think of them as the tiniest of tiny boats, which busy themselves every moment of our lives in carrying precious cargoes to every part of our bodies. These cargoes consist of fuel for the

different parts of the body, which the blood gets from the food we eat.

The word "circulate" means to go round; and the circulation is so called because the blood goes round

and round in our bodies. It never rests for a single moment.



RED BODIES, OR BLOOD CORPUSCLES

As seen under the microscope, magnified 1000 times. The dark circular bodies are the red corpuscles, while near the center two bodies of another kind, or white corpuscles, are seen, with their middle parts stained so that they look black

The blood is found everywhere in the body, even in the hard bones and in the teeth.

How rosy are your cheeks on some cold morning!

How pink is the skin of every healthy boy and girl! This is be-

cause there is red blood just under the skin. How much blood do you suppose there is in your body? Let me tell you. There is one part in every thirteen;

that is, if you weigh ninety-one pounds, then your blood by itself would weigh about seven pounds.

Put your fingers on the thumb side of your wrist, and you may very easily feel a gentle throbbing. Did you feel it? This is made by the blood flowing through its little tube. Did you ever notice the motion of garden hose on the grass when the water is turned on? That is somewhat like the throbbing caused by the pumping of the blood in its tubes.



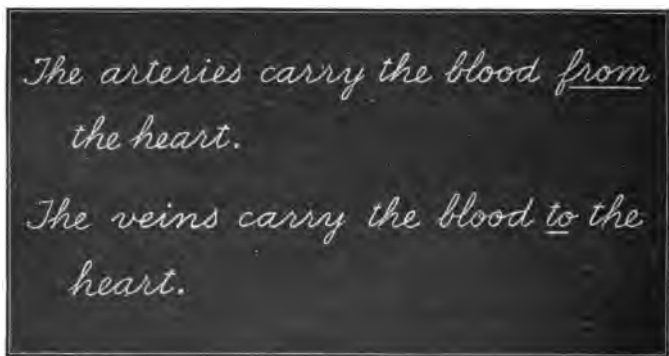
THE PULSE

Teacher showing a schoolboy how to find the pulse at the wrist



COUNTING THE PULSE

These tubes, or blood vessels as you may call them, are of three kinds. Those which carry the blood *from* the heart are called **arteries**. Those which carry the impure blood *to* the heart are called **veins**. Another set of little tubes serves as a passage way between the arteries and veins. These



BLACKBOARD WORK

very small pipes are known by a very long name,— the **capillaries**, — which means they are like hairs. Really, the finest hair is a cable, and a big cable too, compared with these tiny blood vessels.

The smallest of these pipes are so close together, and there are so many of them, that the tiniest needle's point thrust into the flesh pierces many of them.



A LARGE VEIN

The principal vein on the inner side of the left leg, with its largest branches

These little tubes, or threadlike vessels, are so close-set that we cannot prick any part of the true skin, even with the finest needle, without wounding many of them and drawing blood. They are so small that three thousand of them placed side by side would not, in their united width, measure more than one inch.

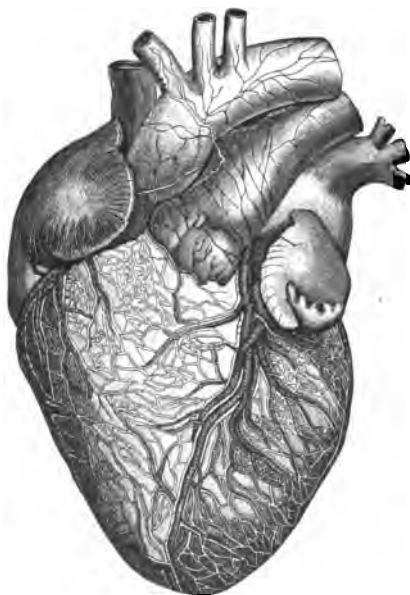
These capillaries have such very thin walls—much thinner than the thinnest tissue paper—that the fluids of the blood can soak through them into the flesh or skin, or, in fact, into whatever part of the body lies next to them.

You may think of an artery and a vein as like two streets, and the capillaries as like a number of little lanes connecting these two streets, through which the blood finds its way from one to the other.

LESSON XXVI

THE HEART,—THE BUSY LITTLE PUMP

What is it that sends the blood into all parts of the body,—except the outer skin, the hair, and



THE HEART
Front view

the nails? Why, it is the force of the most wonderful little pump you ever heard of. There is no steam engine half so clever. What is it, you ask? Well, it is your own **heart**. You may easily feel it beating in the middle of your chest a little toward the left side. There it is, beating as steadily as the tick of the old clock, all day and all

night, year after year, and never needing to be wound up.

What is the shape of the heart? Something like that of a strawberry. Your heart is about the size



THE CIRCULATION OF BLOOD

Schoolboy observing the circulation of blood in a rabbit's ear

of your closed fist, and is really a hollow muscle. If you could look into it, you would find it divided into four parts, or rooms. From each of these four rooms runs a blood vessel through which blood either flows into or out of the heart. It is the large

arteries which carry the blood away from the heart, while the veins carry it back to the heart. In a picture of the heart you will see some pipes coming out of it. These are the larger blood vessels, which, dividing into smaller ones, carry blood all over the body, as water pipes carry water to all parts of a town.

The blood carries certain portions of the food, made ready by digestion and by the fresh air we breathe, to every part of the body. It gathers up, as it goes, the impurities and waste matters, and brings them back to the heart, from which the blood goes to the lungs to be purified.

And then the heart that does all this pumping is no larger than your own fist! What a wonderful, busy machine it is! Just think of it, — beating away thousands of times every day, never stopping except for a second or so, between the beats, from birth till death! If your heart should stop just for one minute you would die.

LESSON XXVII

HOW EXERCISE HELPS THE CIRCULATION OF THE BLOOD

If you could look inside of your bodies and see all that goes on when you move about, you would hardly guess that running and jumping would do you any good. If you could see the heart pumping away and the blood rushing along, you would probably feel half frightened, and think to yourself, "I must not move; I must keep quite still or I shall break something, or stop something."

You wouldn't for one moment suppose that it would do you good to run and jump. You would as soon think it would do a watch good to roll it along the garden walk. How miserable we should be if we had to sit or stand quite still in one place all our lives!

But we were not made for this. We were made to be active, and not to stand still. Hence the machinery of our bodies, which is far more delicate

than that of any machine you ever heard of, is so suited to our wants that it is all the better for a great deal of exercise.



THE BEATING OF THE HEART

Schoolboy listening, with the aid of a stethoscope, to the beating of the heart

Look at boys playing baseball, football, or running races, or going heels over head! Look at girls with their swings or their games of tag! They twist and tumble their bodies about in all sorts of ways; and yet all the time the little heart

goes on with its regular *tap, tap, tap* against the ribs, quite undisturbed by all the odd jumps and jolts. If it does beat a little faster for the exercise, it does us good and not harm.

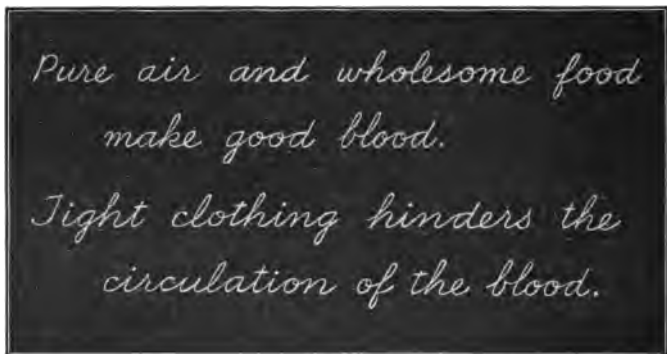
Exercise makes the heart beat faster; then the blood flows faster; and next the lungs have to breathe faster so that the air may be in them in time to meet the blood. The pure blood is then



A LESSON FROM THE BLACKBOARD

sent more swiftly round through the arteries again, clears away the waste matter more rapidly, and feeds every part more quickly as it runs along. This quicker flow gives more life and vigor to every part of the body.

When we feel cold a brisk walk or a lively game will "start the blood" and make us feel warmer. You must be careful not to wear your clothing tight enough to hinder the flow of blood.



BLACKBOARD WORK

Tight garters often cause cold feet and chilblains. Belts, straps, collars, and boots and shoes are sometimes worn tight enough to check the circulation of the blood. Pure air, a wholesome diet, and a proper amount of exercise, rest, and clothing will do much to make the blood healthy and to keep it so.

LESSON XXVIII

EFFECT OF ALCOHOL UPON THE BLOOD VESSELS AND THE HEART

A glass of strong drink may soon "go to the head," as many people know, showing that its effects are quickly felt in the brain.

Let me tell you how this happens. When such liquor is taken into the stomach much of it oozes through the coats of the little blood vessels in its lining, and is rapidly carried into the main blood stream.

When the liquor is once in the blood current it is, of course, swept along into every little nook of the body. You will remember that the blood is carried to the very tips of your fingers and toes. How speedily this poison gets into the blood depends upon the kind of liquor and the state of the stomach.

Did you ever notice how red is the face of a person who drinks strong liquor? Now the flow of blood in the tubes is regulated by the little

telegraph wires which we call nerves. The alcohol weakens these nerves so that they lose their grip on the blood vessels, and more blood than usual flows through them. This shows through the skin, and so makes the drinker's face red and flushed.



ARTERIES ON THE
TOP OF THE
RIGHT FOOT

You may well think that the heart of a healthy person has enough to do without being forced to work still harder; yet all alcoholic drinks give it more work to do. They may cause it to beat faster than is good for it.

Frequent drinking of alcoholic liquors means more work and less rest for this busy little force pump. The result is just what you might expect: the heart gets tired of doing extra work, and after a time it is weary and fails to do even its regular duty well.

WRITING EXERCISES

Your heart is about as large as your closed fist.

The heart is a kind of pump inside the body.

The heart pumps the blood all over the body and keeps it always moving.

A man's heart beats about seventy-two times each minute.

Hard play of any kind makes the heart beat faster.

Blood flows in hard bone and even in the teeth.

The blood is never still; it is moving around through the body all the time.

The tubes that carry the blood from the heart are called arteries.

Bright red blood flows in the arteries.

The tubes that carry the blood to the heart are called veins.

Blood of a darker color, almost purple, flows in the veins.

Do not wear clothing tight enough to hinder the flow of blood.

Belts, garters, tightly fitting boots and shoes may hinder the circulation of the blood.

When we feel cold a brisk walk or a lively game will make us feel warmer.

Every time the heart beats a wave of blood can be felt in an artery.

This wave, or heart beat, is called the pulse.

The pulse may be felt in an artery,—at the wrist, at the temples, and in other places.

The pulse beats about seventy-two times every minute when we are well.

If we are sick the pulse may beat much faster.

REVIEW QUESTIONS

1. How does blood look to the naked eye?
2. What makes the blood look red?
3. Illustrate by some familiar thing.
4. What is meant by the circulation of blood?
5. What are the different kinds of blood vessels?
6. What is the pulse?
7. How and where may you feel the pulse?
8. How much blood have we in our bodies?
9. What is an artery?
10. What is a vein?
11. Describe the capillaries.
12. To what may we compare the blood vessels?
13. What is the difference between an artery and a vein?
14. Show how the heart acts like a busy little pump.
15. Tell what you can about the heart.
16. Why should we be surprised if we could look inside of our living bodies?
17. Show how our bodies were made to be active and not to keep still.
18. Show how exercise makes the blood flow faster.
19. What may be the effect of tight clothes on the circulation of the blood?
20. How do alcoholic liquors get into the blood?
21. What effect does alcohol have on the circulation of the blood?
22. How may strong drink affect the heart?

LESSON XXIX

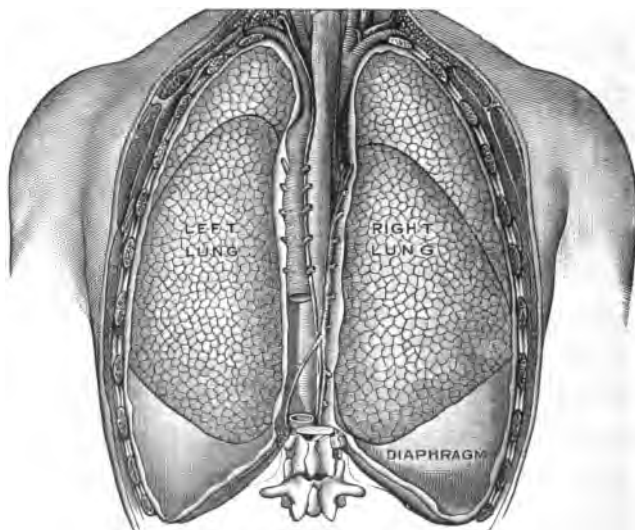
WHY AND HOW WE BREATHE

Do you know what air is? Can you see it? What is it made of? We shall read more of this presently. What is the use of air? Why, we breathe it in order to live. If there were no air in this room we should soon die.

How does air keep us alive? do we eat it? No; we can see the things we eat. Do we drink it? No; we can see the things we drink. And yet we really feed on it. What do you mean? you ask. Why, we feed on air every moment,—that is, we breathe it.

Breathing is feeding on the air. Cats and dogs breathe; their sides move in and out as they breathe, just as we may see our own chests do. Haven't you ever noticed the breath puffing out of a horse's nostrils after a brisk trot? On cold winter mornings we may see our own breath coming out of our mouths like clouds of steam.

With the shoulders well thrown back take a deep breath and hold it. Now strike the upper part of your chest just below the collar bone with the palm of your hand. Strike your knee in the same way.



THE LUNGS

As seen from behind

Notice what different sounds you get! How do you explain this? Why, your chest sounds hollow—almost like a drum—because the two **lungs** which are inside your chest are full of air.

When we breathe, the air goes down into our lungs, which are two large, pinkish organs filling up the greater part of the chest cavity. The lungs cover up the heart, except a little part of it on your left side. This is where you can feel it beating so plainly. The lungs are somewhat like two large sponges. They are full of a great many little blood tubes and a countless number of little air sacs.



BOY LISTENING, WITH AID OF THE STETHESCOPE, TO THE SOUND OF BREATHING IN THE LUNGS

There is only a very thin skin between them, so that the blood almost touches the air. By means of this very thin skin the blood gets rid of a part of the

waste and useless things it has been collecting from all parts of the body and takes in the fresh air which the body needs.

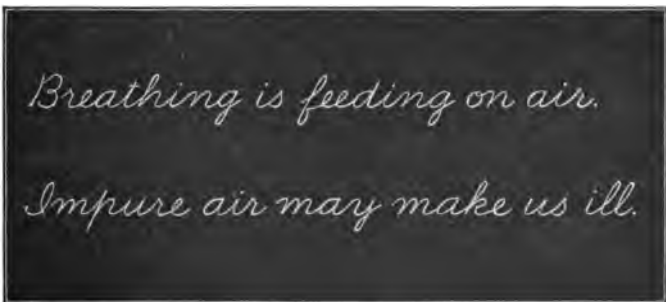
Ask the butcher or the marketman to show you the lungs, or "lights" as he calls them, of a sheep or a calf. Take a small piece in your hands. It is quite soft and light. Press your fingers into it and it sinks, but rises again like a sponge as you let go. Throw a small piece into a basin of water. It will float because its little sacs are full of air.

We may look upon the lungs as a kind of market place where two merchants, the blood and the air, meet to exchange their wares. About sixty barrels of air pass in and out of the lungs every day. We may indeed call them a very busy market place.

LESSON XXX

HOW THE AIR IS CHANGED BY BREATHING

When we breathe we do not simply draw in air and send it back again: we draw into the lungs with the fresh air some very necessary things that our bodies must have; and we breathe out with the



BLACKBOARD WORK

impure air some things which the body has used and needs to get rid of We breathe out those tiny bits of our own bodies which are just ready to decay. These alone give the air the sickly smell which we so often notice in an overcrowded room.

If we breathe upon a bright knife blade or a looking-glass, you know, it becomes dim and damp. What causes this dampness? Why, the little drops of water that we breathe out. The air we breathe out is warmer than that which we take in. Every boy has learned this by blowing on his fingers on a cold day to keep them warm.

Again, we breathe out a kind of poisonous gas, which we cannot see any more than we can see the air itself. Sometimes, in a close room where a great many people are sitting, the air becomes filled with this impure gas and it poisons them. They soon begin to feel dull and sleepy and grow pale and faint.

Many miles away from your home there is a cave through which a gas, very much like that which you breathe out into the air, comes out of the ground. This poisoned air is so deadly that once, when some people living near by put a dog into it for a few minutes, the poor animal almost died. If they had left it in the cave long it would surely have died. But they did not wish to kill the dog; they dashed water over it, let it breathe the fresh air again, and soon the poor animal was as well as ever.

Some of these people, however, would put a dog into this impure air out of mere curiosity, in order to see what would happen to it; but it is not right to do this. They must be cruel people who would thus treat any living creature after it is well known that the air in the cave is poisonous.

Perhaps you have read the story of the "Black Hole of Calcutta." Many years ago a cruel prince in the far-away land of India, having captured a hundred and forty-six Englishmen, crowded them, one hot night, into a little room where two small windows did not let in enough fresh air for the prisoners to breathe.

The poor captives struggled and fought for air; but at last the deadly gas you have just read of began to poison them, and in the morning only twenty-three were alive.

Animals also need pure air to make them healthy, and if we shut horses and cows up in damp, dark stables where the air, poisoned by the filth of the barn, is made unfit to breathe, we cannot expect the horses to work well or the cows to give good milk.

LESSON XXXI

HOW BAD AIR MAKES US ILL

Many other things besides the waste matter from our breaths make the air unfit to breathe. Even pleasant odors, like those of roses and lilies, are unwholesome if the flowers are shut up in a room. Dirty walls, ceilings, and floors give the air a close, musty smell; so do dirty clothes, damp cellars, and filthy sinks.

Some of these things ought not to be in the house at all; others remind us to open the windows wide and let in pure air.

Did you ever notice, when the bright sunlight streams into a room where people are at work, how thick the air is with bits of dust? Now some kinds of dust are very hurtful to breathe into the delicate air cells of the lungs. Men who work in mines have to breathe in much dust, which irritates the lungs, and often causes "miner's consumption." The dust which floats in the air in match factories,

white-lead works, and some other workshops, is very unwholesome to breathe.

A white powder—a poison—called arsenic is sometimes used in wall paper. If we should sleep



A LESSON FROM THE BLACKBOARD

in a room with this kind of paper on the walls we might breathe in enough of the dust from the arsenic in the air to make us quite ill.

While all we have told you about the harmfulness of bad air is of importance to people in good health, it is of still more importance to sick people; they need good air as much as they need good food. Everything that comes from a sick person's body is still more unwholesome than that from a healthy person's, and may be a downright poison.

Many learned men now believe that often diseases are really sown in our bodies by a kind of very small seeds, called **germs**, much as flower seeds are sown in the ground. Some of these germs, they tell us, float in the air. If we breathe them in they are quite likely to give us some "catching" disease, like scarlet fever or measles, if we have not already had it; or maybe typhoid fever, whooping cough, or some other serious illness.

LESSON XXXII

PURE AIR, AND HOW TO GET IT

We need pure, fresh air to breathe as much as we need clean food to eat, or pure water to drink; that is, the air cannot purify the blood unless it is *pure* air. Now if a room is crowded with people they soon use up all the pure air; and unless fresh air comes in through the windows or doors they have to breathe the bad air over and over again.

This may make them feel tired and dull after sitting for a long time in a crowded room. The air is loaded with that deadly gas which we just read about, and acts like a slow poison. In brief, they do not breathe in enough good air to purify the blood in the lungs.

We must remember that we need pure air just as much by night as by day. Of course we go on breathing all night. If we are so unwise as to shut in the bad air and keep out the pure air all night, we must not expect to wake up feeling well. We

all know how very unpleasant it is to go into bedrooms which have not been aired.



ILL EFFECTS OF BREATHING
IMPURE AIR

While at play a boy has hid in an old chest; the lid fell and the supply of pure air was cut off

Those who have tried it know very well that they sleep better and wake fresher if they keep the air of their bedrooms sweet and clean all night. There is hardly a night in the whole year when it is not safe to keep a window open two or three inches at the top. We must, however, have proper covering on our beds to keep us warm.

How is it about the air of schoolrooms that are crowded with children? The air soon becomes bad, and the pupils are uneasy, dull, and sleepy. What shall we do? Why, let out the bad air and let in the pure air.

How are we to get rid of this bad air and let in fresh air without being too cold? — for it is a bad thing to be cold, and a cold draft is especially dangerous. In summer time this is easy, but in winter it is more difficult; still, if we will give our minds to it, and use good sense, we shall find out what to do. In the first place, open the doors and windows of the schoolroom before and after each session, at recess, and during the gymnastic exercises.

If you open your window at the top it will let out the bad air, and you will not feel a draft. If it is so cold that you cannot have the window open even a little at the top, it is a good plan to have an opening near the top of the room, so as to give some way of escape for the bad air; but it is very seldom that, if you have a brisk fire and proper clothing, you cannot bear to have the window a little way open at the top.

There is nothing better than plenty of pure, fresh air to make pupils like to study.

In brief, there can be no good health without pure air. Always have it if possible.

LESSON XXXIII

HINTS ON BREATHING PURE AIR

Suppose you breathe out a long breath of air and then take a tape measure and measure your chest. Now draw in a deep, full breath and measure your chest again. How many inches larger is it? Now suppose you tie a stout cord tightly around your chest just where it reaches when you have breathed out. Then try to take a long, deep, full breath. Does it hurt you to do it? Certainly. Why is it? Simply because the cord will not allow your chest to swell out or expand.

We can now see what happens if we wear our clothing too tight around the chest and waist. We know that the lungs need plenty of room because they are larger when they are filled with air.

If we begin when we are little children to wear the clothing tight across the chest, and binders or belts tight around the waist, the ribs are pressed in, the chest becomes smaller, and the lungs do not

grow to their full size or have a chance to expand with each deep, full breath.

No boy or girl would wish to grow up and have weak lungs. Can we do many things to make our lungs strong and healthy? Yes, indeed. We can wear our clothing loose, so as to give the lungs more room to expand. We can put our hands on our hips, throw the shoulders back, hold the head erect, shut the mouth, and then draw in our breath until we feel the lungs grow



SCHOOLGIRL SHOWING BY MEANS OF
A TAPE MEASURE HOW THE CHEST
EXPANDS DURING BREATHING

larger. It is very much better to do this deep breathing in the open air; if you practice only in the house or schoolroom, you must be sure that there is plenty of pure, fresh air to breathe.

We can make our lungs much larger and stronger by breathing right. Every one should know how to breathe properly, and do it every day of his life. First, we should learn to keep the mouth shut and breathe through the nose; next, we should take long breaths, and do it just as we have been told; again,



BLACKBOARD WORK

we must sit and stand with the shoulders well thrown back. When we first begin we are sure to get out of breath. Now we ought to do some hard work, or take regular exercise of some sort, every day. After a time we shall be able to run half a mile, or even more, without getting out of breath. We must be very careful not to get too tired.

Leave the windows of your bedroom wide open every morning after you get up, and let in the pure, fresh outdoor air. At night, provided the bed has enough covering, you will sleep much better if the air in your bedroom is fresh and cool. Even in the coldest winter nights it is safe to have the windows of your sleeping room lowered at the top and slightly raised at the bottom.

Did you ever notice that you sometimes feel sleepy in the schoolroom? Is it always because you are dull and perhaps tired of your books? No, indeed. It may be because the air in the schoolroom is not pure. If the teacher opens wide the windows for a few moments and lets in plenty of fresh air, you feel much better at once, and are glad to study well until school closes.

LESSON XXXIV

HOW ALCOHOL AND TOBACCO ARE HURTFUL TO THE AIR PASSAGES

Did you ever hear the wheezy, broken talk of a person who had long been used to drinking alcoholic liquors? What was the trouble? Why, the alcohol had irritated the lining of the air passages.

Don't you remember how, when you have breathed the fumes of a burning match, they have irritated your throat, and made you wheezy and hoarse for a few minutes? Now it is in this same way that strong drink often acts to make the voice rough and broken.

But this is n't all: this irritation may spread into the delicate lining of the lungs themselves, and after a time make it thicker. This makes the breathing space less.

You will remember that you were told in Lesson XXVIII that alcoholic drink lessens the control of

the nerves over the blood vessels, and causes too much blood to flow through them.

Now this repeated stretching of the tender little blood tubes of the lungs makes one who uses strong drink more liable to attacks of severe cold, lung fever, and other diseases of the air passages.

How is it about tobacco? Why is that hurtful? Because breathing air full of tobacco smoke is also apt to cause irritation in the air passages. Breathing tobacco smoke through the nose is hurtful to the throat and lungs. Cigarette smoking is especially irritating to the air passages.

WRITING EXERCISES

The air which we breathe goes to our lungs.

Pure air has oxygen in it, which keeps us alive.

We must not breathe the same air over and over again.

To take in a great deal of oxygen, we must breathe in long, deep breaths of pure air.

Strong, healthy lungs help to keep us well.

No one can be well and strong who has weak lungs.

Pure air has no odor.

We need pure air in every room in which we sleep, play, or study.

We may enlarge the lungs by practicing deep breathing every day in the open air.

Breathing bad air makes us dull and stupid.

We need pure air to purify the blood.

When we fill our lungs with air they expand, or become larger.

Our lungs must have plenty of room in which to expand.

The air which we breathe out is impure.

We cannot have good health without pure air.

We need pure air to breathe by night as well as by day.

We must be very careful to have plenty of fresh air in our bedrooms.

Even if it is cold outside, open your bedroom window a little at the top.

Tobacco smoke makes the air impure.

The air in a sick room needs to be changed often, for it may contain the germs or seeds of disease.

Cigarette smoking does harm to the air passages.

REVIEW QUESTIONS

1. Of what use is the air?
2. What familiar examples can you give showing that animals breathe?
3. What is meant by breathing?
4. What simple experiment can you describe that shows that the lungs are filled with air?
5. Describe the lungs.
6. Where are the lungs situated?
7. What takes place in the lungs?
8. How is the air changed by breathing?
9. What poisonous gas is found in the air we breathe out?
10. What similar gas is found in nature?
11. What illustrations of this fact can you mention?
12. Describe some other things which may make the air unwholesome to breathe.
13. Show how pure air is necessary to sick people.
14. What are the effects of breathing the air over and over again?
15. Show why we need pure, fresh air as much by night as by day.
16. How may you keep the air of your bedroom fresh and pure?
17. How can you show that the chest expands during deep breathing?
18. What effect does alcohol have upon the air passages?
19. How does tobacco affect the air passages?

LESSON XXXV

THE SKIN

Our body is covered with a soft, tight-fitting garment, which is easily kept clean, and which never wears out. What is this dress suit that kind Nature gives us? Why, we call it the **skin**. The skin fits us like a smooth glove. If we take up a little fold of it, it will stretch like a piece of India rubber. Let go of it, and the skin quickly flies back like rubber, and looks as it did before we pulled it.

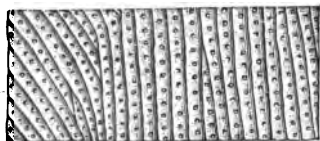
We might almost say that we have two skins. The outer, or **scarfskin**, has no blood vessels or nerves in it. You know we can give ourselves a little scratch without making the blood run, or feeling any pain from it. It is usually this outer skin that is raised into a blister when we burn our fingers.

If you have ever torn off the outer layer of a blister, you know how very tender is the pink skin underneath. This is the **true skin**. When this is

torn or burned a scar is made. Look and see if you can find somewhere on your hand a white scar made by a deep cut.

The scarfskin really consists of a countless number of little horny scales, laid one above another somewhat as several layers of shingles are placed on the roof of a house or barn.

The outer scales are all the time wearing out and rubbing off, and new ones are always forming underneath.



THE SKIN IN THE PALM OF
THE HAND

Showing openings of sweat pores
(magnified 4 times)

A snake, as you probably know, sheds its whole skin at one time,—as if a boy should crawl out of his clothes, leaving them shaped as when he wore them; and sometimes you may find in the fields or woods its cast-off skin, turned inside out, just as when the snake squirmed out of it and crawled off with a soft new dress on.

We all know that birds shed their feathers,—or molt, as it is called; that is, they change their clothes in this way. So cats, dogs, horses, and cows shed their hair and thus get rid of their clothes.

Now we shed our skin, a little at a time, and in such powdery scales that we usually cannot see them; but if we take any garment that has been worn next to the skin, and shake it in the sunlight, we can see how much dust there is inside of it.



SCHOOLBOY EXAMINING THE
SKIN IN THE PALM OF THE
HAND WITH THE AID OF A
MAGNIFYING GLASS

This dust is really made up of tiny pieces of the scarf-skin which have dropped off or worn away. Where the skin is pretty thick, as on the palms of the hands or the soles of the feet, we can, when we bathe, see dead skin peeling off in little scales.

We may think of the skin as somewhat like the bark of a tree. Next to the hard wood of a tree is a tender bark, which is a great deal like our true skin. On the outside is the rough bark, which is like our outside skin. You know that we can cut or tear off the bark without hurting the tree if we do not cut too deep.

LESSON XXXVI

WHY WE NEED TO BATHE

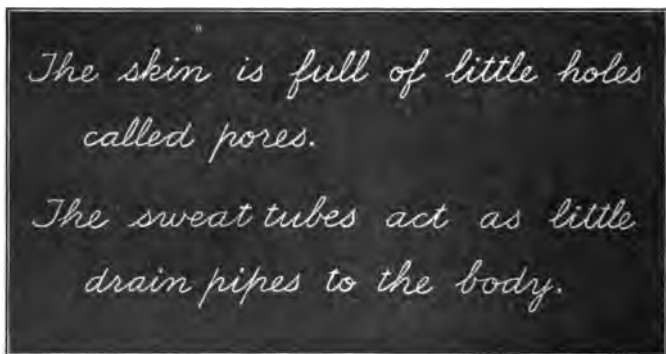
Did you ever look at your skin through a magnifying glass? If you ever did, you found it full of little holes, or **pores** as they are called.

Just think how very small these pores are! It is said that several thousands of them have been counted on the tip of one finger. Each pore is the opening of a tiny pipe just under the outer skin, which is rolled round and round like a ball of the finest silk.

If you could unroll all these little tubes, and put them end to end like a gas pipe, they would reach several miles. Do these little pipes have to work hard? Indeed they do. They work all the time, night and day, winter and summer. Through them a kind of fluid oozes out, which is called **sweat**.

We all know that the sweat is not clean, pure water. It has in it, besides water, waste matter which would make us ill if we did not get rid of it.

Thus you see that the sweat tubes act as little drain pipes to rid our bodies of waste matter. Suppose the drain pipes that lead from your house should get clogged; you can guess what an unhealthy state the house would soon be in. It is just so with our bodies if the sweat tubes get clogged.



BLACKBOARD WORK

If a person had his whole skin varnished over, so as to stop up all the pores, he would die within a few hours. The story is often told of a little boy who was completely covered with gold leaf in order that he might play a part in a show. He was afterwards put to bed without washing the gold off,

and when his parents tried to rouse him the next morning he was dead.

How necessary it is, then, to have a clean skin and to wear clean clothes! Clean bedclothes, a clean nightdress, and a good bath will help us to sleep soundly and to wake up in the morning feeling well and strong. Many people think they have done quite enough if they wash their hands and faces and other parts that are seen every day; but it is even more necessary to wash the parts of the body which are covered with our clothes and not open to the air, because much of the dirt which the body throws off remains on the surface of the skin and is not rubbed off, as it might be from our hands and face.



THE ACTIVITY OF THE SWEAT
PORES

Shown with the aid of a hand glass

LESSON XXXVII

HINTS ABOUT TAKING A BATH

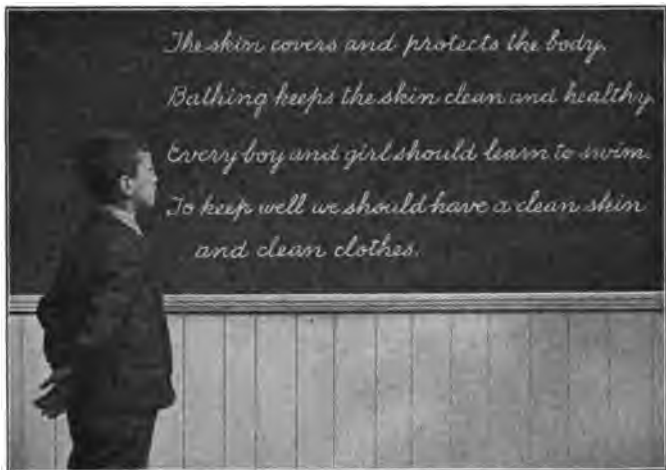
You know how fond birds are of taking a bath. It is very amusing to watch them, they enjoy it so much. They do not shiver at the touch of cold water, as some children do. They take great pains, as you know, to throw it over their backs and heads, and to get washed all over.

Now a cool bath in the morning will make us better in every way. It may make us feel a little chilly at first but the blood will soon run the faster for it, and a pleasant glow will be felt all over the body.

A bath at bedtime is refreshing, and will help us to sleep soundly. There is little risk of taking cold if we go to bed at once.

It requires very little time or expense to take a daily bath of some sort. A hand basin, a sponge, a piece of soap, a gallon of water, and a towel are all that are needed. Rubbing the body every day, first

with a damp towel and afterwards very briskly with a dry one, will keep the skin clean enough during



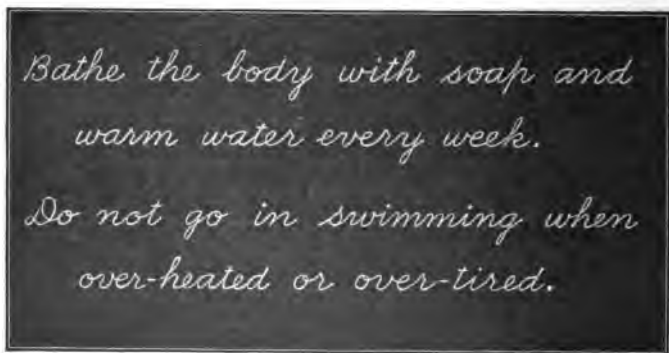
A LESSON FROM THE BLACKBOARD

the week, provided a bath with soap and warm water is taken once a week.

Most persons, especially the young and vigorous, soon get used to cool, and even cold, water baths. The good effect of a bath is shown by the warm glow which follows the rubbing with a towel after bathing. The warm glow means that the blood is flowing faster through your body, and is reaching every

part of it, just as it does when you play a game of baseball or run a race with some playmate.

Swimming in fresh water or in salt water is one of the best of exercises. Young people should be taught to swim. In olden times the Romans, to show their dislike for an ignorant person, would say, "He can neither read nor swim."



BLACKBOARD WORK

We should never go in swimming when we are over-heated or very tired. Every year many people are made sick and many are drowned through ignorance or carelessness in this matter alone. The risk is from sudden cramps, which cause even a strong swimmer to sink like a lump of lead. For the same

reason it is not usually safe to swim just after a full meal. We are told that Alexander the Great once nearly lost his life by bathing in a very cold river just after eating a full meal.

While bathing at the seaside or at the lakes, young people should not stay too long in the water. Most animals enjoy a swim, and we all like to



A DOG SWIMS TO THE RESCUE OF HIS YOUNG MASTER

throw a stick in the pond for the dog to bring out. Dogs have been known to bring out something much more precious than a stick,—a little struggling child, who would otherwise have been drowned. We should be very kind to dogs, cats, and other pets. They give us much pleasure, and, on their part, look to us for care and protection.

LESSON XXXVIII

CLOTHING, AND HOW TO WEAR IT

A thin and delicate skin is our only natural covering. Why do we need any other? Why do we need clothing?

Because our bodies are, as you know, usually much warmer than the air out of doors, so they are always giving out their heat to the air.

When our bare skin is exposed we lose heat rapidly, and feel chilly and cold; hence we wear clothes to keep the heat of our bodies from escaping too quickly into the air.

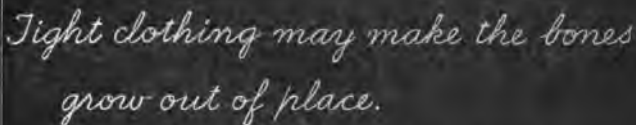
Is there another reason for wearing clothing? Yes; in the summer weather, especially in hot countries, the direct rays of the sun might blister the skin.

Again, clothes save the skin from being torn or hurt by accident; they also keep out the wet, so that we can better bear exposure to rain or snow.

We like to wear clean clothes because they help to make us feel comfortable. This is true not only

of garments used for day wear, but of bedclothes and night clothes. Undergarments should be frequently and regularly changed. Bedclothes should be exposed freely to the light and to fresh air.

Sick people often tell us that a clean nightdress and clean sheets and pillowcases do them more good than medicine, and now we can see why.



*Tight clothing may make the bones
grow out of place.*



Walking is the best of all exercises.

BLACKBOARD WORK

It is because the dirty linen is loaded with the waste and impurities which the body is trying to get rid of.

Clothes should be changed according to the climate or season of the year. It is not prudent to leave off winter clothing too early in the spring. Never wear wet or damp clothes one moment longer than necessary. If you get wet, take the

shortest way home, rub down thoroughly, and put on at once dry, warm clothes. Do not let your damp skirts and wet stockings or shoes dry on you, but always change them at once.

You must see to it that you wear proper outside garments on going out, and that they are taken off on coming indoors. Pupils should not sit in the schoolroom with outside garments on, such as rain coats, gossamers, cloaks, rubbers, rubber boots, and leggings. Do not wear rubber clothing indoors,—nor out of doors when it does not rain. It prevents the perspiration from passing off, and so does harm if kept on very long at a time.

In cold, snowy weather children should wear leggings. They should be taken off at school, leaving the stockings dry. Rubbers, if worn too long, keep the sweat from passing off, and so should be removed on entering the house or schoolroom.

The clothing should be worn loose enough over the chest to allow us to take full, deep breaths. Plain, strong clothing, not easily torn or soiled, and worn loose enough to allow free and easy motion, is the best for young people.

LESSON XXXIX

ALCOHOL AND THE BODILY HEAT

How often do we hear people excuse themselves for using strong drink in cold weather by saying that it makes them warmer! Does it really make them warmer? No, indeed. "But," they say, "is n't there a feeling of warmth over the body after a drink of liquor?" To be sure there is. How does this happen?

You remember that alcohol has the power to make the nerves lose their grip on the little blood vessels, especially those near the surface of the body. It is the same as if the garden hose should be suddenly stretched when water was being pumped through it. Of course more water would be forced through.

Now you will see how more blood is driven to the surface of the body from the inside. This outside heat is rapidly cooled off by the air. Thus you see that the surface is warmed for a little while

at the expense of the deeper parts. There is no real increase of heat, but there is actually less heat in the body, after taking strong drink.

People who live in cold countries know all this by experience. Do you suppose the Arctic explorers let their men drink all the strong liquor they please? No, indeed. If they did, they could not endure the fearful cold and exposure of those icy regions.

It is the same in hot countries. Army officers employed in the hottest parts of the world have found that alcohol is a real injury to their soldiers.

WRITING EXERCISES

The skin covers and protects the body.

The skin is easily kept clean and never wears out.

The oil glands keep the skin smooth and soft.

Bathing keeps the skin clean and healthy.

The skin is made up of two parts.

The outer skin is known as the scarfskin.

The scarfskin consists of a great number of horny scales.

These scales are all the time wearing out and rubbing off.

The real, or true skin, is the pink part underneath the scarfskin.

The skin is full of little holes or pores.

Each pore is the opening of a tiny pipe, or tube, under the outer skin.

Through these pores a kind of fluid, called the sweat, oozes out.

The sweat tubes act as little drain pipes.

To keep well we should have clean skin and clean clothes.

To have a clean skin we must take baths very often.

Boys and girls soon get used to cool, and even cold, baths.

Every boy and girl should learn to swim.

Swimming is one of the best of exercises.

We must not go in swimming when over-heated or very tired.

Without clothing our bodies would soon lose heat, and we should feel chilly and cold.

Clothing protects the skin from the hot rays of the sun.

Bedclothes should be exposed to the light and to fresh air.

Do not let wet clothing dry on you, but change at once for dry, warm clothes.

REVIEW QUESTIONS

1. How is the body covered?
2. Describe the scarfskin.
3. What is the snake able to do with its skin?
4. How do we shed our skin?
5. What proof of this can you give?
6. To what may we compare the skin?
7. Tell what you can about the true skin.
8. What is the sweat?
9. What is another larger and harder name for the sweat?
10. Where does the sweat come from?
11. To what may we compare the sweat tubes?
12. Why do we need to bathe ourselves?
13. Give some hints about taking a bath.
14. What can you say about taking baths in cold water?
15. What are some of the dangers of swimming?
16. Do some animals enjoy a swim?
17. Why do we need clothing?
18. Give some hints about the use of clothing.
19. Do sick people enjoy clean clothing?
20. What hints can you give about the change of clothing?
21. What can you tell about taking off outside garments on coming indoors?
22. What is the effect of alcoholic liquor upon the heat of the body?
23. What effect does alcohol have upon the power of the body to endure heat or cold?

LESSON XL

THE CARE OF THE TEETH

If you had a beautiful pocket knife, you surely would not put it away when soiled without cleaning or wiping it. You would do all you could to keep it bright and well polished, wouldn't you? Yes, indeed. It would certainly be very careless of you to let it get rusty for want of wiping it clean.

We should be very careless and foolish if we neglected to keep our teeth and mouths clean; for our teeth are really a set of little knives, given to us for our use, health, and comfort, while the mouth is the case in which the knives are kept.

Our teeth are covered with a bright, shining kind of polish, which is somewhat like the outside coating of china ware. It is very hard, and helps protect the teeth from decay. This polished coating is called *enamel*, and just as long as this is firm and whole the teeth cannot decay. But when this enamel is cracked or broken by biting something

hard, by cracking nuts, crushing hard candy, or biting off stout thread, then the softer part of the tooth underneath begins to decay, and pain is soon felt. Most children know what it is to suffer from the pain caused by decayed teeth.

The teeth should be well cleaned with a soft brush and warm water after each meal, and also at



BLACKBOARD WORK

bedtime. Some simple tooth powder may be used. Always brush the teeth on the inner side, or back, as well as on the front.

The teeth should be well brushed after eating the various sweet stuffs. Such foods stick between the teeth, and unless removed are apt to make the teeth decay.

Picking the teeth with a pin or needle is hurtful. A piece of strong thread or floss silk may be drawn to and fro between the teeth to remove every piece of food which cannot be reached by the brush.

Dirty and decayed teeth are often the cause of a bad breath and a foul stomach. You must use the greatest care to save your teeth. If an ounce of prevention is ever worth a pound of cure, surely it is in keeping the teeth in good order.

The first, or milk teeth, as you know, last only a few years, and yet they should not be neglected. If they are allowed to remain after they should be removed, they may injure the second set or cause the new teeth to grow out of place.

There is little excuse for bad teeth. Do not wait for cavities to grow larger, but allow your dentist to examine the teeth at least twice a year.

LESSON XLI

GOOD EYESIGHT, AND HOW TO KEEP IT

The eye is very delicate and sensitive. You know how it hurts when we get even a small cinder into the eye. It is very easy for the eye to get out of order, and it may be a very slow matter to make it well again.

Did you ever have the measles? If so, you know how weak your eyes were for a long time afterwards.

You must not get into the habit of reading in bed at night, or while lying down in a darkened room. You must never try to read at dusk, especially if the print is poor.

After you have used the eyes for some time, as in reading, you should rest them, even if only for a minute, by looking at something far away.

After you have read or sewed for a long time, you know, the eyes are apt to smart, or the sight becomes dim or blurred. This is a hint for you to stop and rest them.

How often we get things into the eyes! We are almost sure to feel like rubbing them, but this is the



A LESSON FROM THE BLACKBOARD

worst thing any one can do. The foreign substance should be removed at once. Rubbing the eye or pulling the eyelids only forces the cinder or dust

farther under the lid. The Germans have a quaint saying that the eyes should never be rubbed except with the elbows.

Sometimes your slate is greasy, or the print of some schoolbook, especially that of maps, is fine or blurred. You must be careful, or else your eyes may suffer from the strain.

Do not expose the eyes to the bright light reflected from snow unless it cannot be helped. Do not read out in the bright sunlight or in the dim light at dusk. The light should be at one side or behind you. If you face a bright light while at work or while reading, it is apt to make the head and the eyes ache, and, besides, you cannot see well.

Tobacco and alcohol often inflame the eyes, especially the lining of the lids. Cigarette smoke is often hurtful to the eyes.

Let us then not forget that our eyes are like two precious gems, put in a carefully made case. We must be careful to keep them safe and sound, so that we may be able to use them all the days of our life.

LESSON XLII

HINTS FOR THE SICK ROOM

Even if we are children we can learn a few simple things about the care of a sick room. With skillful hands and willing hearts we may save older people from taking a great many steps.

The sick room should be the lightest and most pleasant room in the house. All extra carpets, upholstered chairs, heavy curtains, and any furniture that shuts out the air and sunlight should be removed. These things absorb the impurities and help to keep the room foul. A bare floor, with a rug or two on it to deaden the footsteps, is much better than a woolen carpet.

Let the room be open to the sunlight and the fresh air. Do what you can to prevent the noise of steam and electric cars, heavy teams, and children, from troubling sick people. See that sick people are not annoyed by the noise of windows that rattle, blinds that slam, and doors that creak.

With a little pains, any sick room may be supplied with pure air. Do not let the smell of cooking food, especially of cabbages, frying fish or pork,

reach the sick room. Do not allow a kerosene light, with its flame turned down, to burn through the night.



A NURSE FOR THE
SICK ROOM

Keep a sick room neat and trim. Take away at once all offensive matters. Never allow such things to remain even for a short time in the sick room. In many diseases, and especially in scarlet fever, diphtheria, consumption, etc., use pieces of old linen instead of handkerchiefs, and burn them as soon as used. Carelessness or igno-

rance in this matter often spreads contagious disease. Change the clothes of the bed and of the sick person quite often. Do not let these be put away in a closet with other clothing.

Do not have a great show of bottles of medicine, spoons, glasses, etc., but keep all such things in the next room. Some simple things, like an orange, a few favorite flowers, and one or two playthings, may be placed upon a small table at the bedside.

Never get behind the door or in an adjoining room and whisper. Whatever must be said, say it, but in a low, gentle voice. The bed should be used only for the sick person, and callers should never be allowed to sit or lean upon it.

Let me now tell you a few simple things that even the youngest children in school should know about sicknesses that spread. Do not wet the fingers in the mouth and then turn the leaves of library books, for the leaves of books may be the hiding places of sicknesses that spread.

Books used by children who are recovering from diphtheria or scarlet fever and then returned to a library may be the means of spreading these dread diseases through many families.

Do not put anything into your mouth that another person has had in his mouth. This means chewing gum, candy, drinking cups, bean blowers,

and many other things commonly used at school and on the playground.

If any one of your family is ill with some contagious sickness, be sure to put every knife and spoon used by the sick person into boiling water for several minutes before it is used by any other person. Water that is simply hot is not sufficient for this purpose. The water must be *boiling*, and it is better if the articles are placed in the water and the water boiled for ten minutes before they are taken out.

Do not put pencils in the mouth. Do not put money in the mouth. This is extremely important, because money is liable to come in contact with all sorts of people and to become infected with germs that spread disease.

Turn the face aside from others when coughing. This will sometimes prevent contagion passing from one person to another, because the breath in coughing may cause the spread of germs of disease.

Old pieces of cloth, paper napkins, old clothing, and all other things that have been used in the sick room or about the bed or the body of the sick person should be burned at once.

LESSON XLIII

A FEW SIMPLE RULES OF HEALTH

Read some pleasant book, laugh, talk, sing, play some easy game, or rest in some other way for half an hour before going to bed. Children should not play hard for an hour before bedtime. Some kinds of food, also tea and coffee, often prevent sleep, and therefore should not be taken late in the day.

The skin takes in certain poisons, like lead, very easily. Cheap clothing, such as colored stockings, is often dyed with lead. Such clothing should be thoroughly washed and rinsed before it is worn.

Never put earpicks, pins, hairpins, toothpicks, or similar things into your ears. It is a foolish, needless, and dangerous practice. Let the earwax alone; it will take care of itself. Never try to remove it with a pin or ear spoon. The tip of the little finger, covered with a handkerchief, will do very well to relieve any itching.

Diving into deep water often injures the ears. Do not ever shout suddenly into a person's ear. Very loud sounds may injure the ear, and perhaps may result in deafness. When there is to be a



BLACKBOARD WORK

loud noise, as the discharge of a cannon, hold the mouth wide open.

Do not go to sleep with the head on the window sill, or in any place that may expose the ear to cold or damp air.

The ears need special care after an attack of scarlet fever or diphtheria. Pupils are often thought to be dull or heedless in the schoolroom when they are only hard of hearing.

Bathing the ears in very cold water may do harm. A doctor's advice should be asked in regard to any trouble with the ears. Earache may often be due to decayed teeth.

Woolen clothing should always be worn next to the skin in winter. Do not leave off winter clothing too early in the spring, or take off your winter flannels on a warm day in early summer. Never sleep in the clothes that are worn during the day.

Do not wear scarfs, furs, and wraps around the neck. If you do, you are quite likely to catch cold or to have a sore throat if your neck is exposed on some cold day when you have forgotten to wear your scarf.

The finger nails should be trimmed once a week with scissors. Do not trim them to the quick, or



A SCHOOLGIRL'S HAND, WITH
FINGER NAILS KEPT IN GOOD
ORDER

scrape the upper surface with a penknife. Do not get into the foolish notion of biting your nails.

See that your finger nails look like lovely little pink shells that you often find along the seashore in the summer. If we do not take proper care of the teeth, the hair, and the nails, our person will present an untidy appearance that no amount of fine clothing will conceal.



BLACKBOARD WORK

As you grow older, remember never to give paregoric or any kind of soothing sirup to your younger brothers or sisters whose crying may annoy you. Never give to them, or take yourself, any unknown or unmarked medicine which you may find in a closet or elsewhere.

The hair should be often washed, combed, and brushed, but do not wet the hair when combing and brushing it. Do not plaster down the hair with various kinds of dressings. Keep the scalp neat and clean by washing and brisk rubbing.

Children, and older people too, should never run outdoors without proper covering for the head. Always keep your feet warm and dry. Do not sit in a warm or crowded room with cold air blowing on you. Put on more clothing, change your seat, or even leave the room, if necessary, to avoid the draft.

There are some kinds of hazardous sports and games in which young people should never indulge. What are they? Let me tell you. Boys should never walk on the hands, with the body in the air. Children should not whirl on one foot, or swing too long or too hard.

Silly habits, such as pulling the fingers to hear the joints "snap," or pushing the eyes to one side so as to "see stars," are attended with danger, and should be carefully avoided.

WRITING EXERCISES

The eye takes a picture of everything we see.

Tears keep the eyes moist and help wash out specks of dust.

The best eyes are kind eyes, which see to do good to others.

Be sure that your eyes help you to tell the truth.

Do not look steadily at the bright sunlight or at any very bright light.

It is easy to get our eyes out of order.

It may be a very slow matter to make them well when they are once out of order.

Do not use the eyes too much when you are sick or not feeling well.

It is bad for the eyes to read in bed or in a darkened room.

Stop and rest the eyes when they smart or the sight is blurred.

We must not read fine print at dusk.

Do not rub the eyes when you get anything into them.

It is bad for the eyes to stretch or pull the eyelids.

Take pains to supply the sick room with plenty of pure air.

Let the sick room be open to the sunlight and the fresh air.

Always keep the sick room neat and trim.

Do not allow any whispering in the sick room.

A few pretty flowers will make things look pleasant in the sick room.

Sick people like quiet and rest while in bed.

The clothing on the sick bed should be changed quite often.

Never lean upon, sit upon, or jar the sick bed.

In taking care of the sick always follow the doctor's orders.

REVIEW QUESTIONS

1. To what may the teeth be compared?
2. What is the enamel of the teeth?
3. Why should we consult a dentist quite often?
4. How should the teeth be kept clean?
5. What care should be taken of the milk teeth?
6. Give some hints about the care of the teeth.
7. Why is the eye very delicate and sensitive?
8. What should be done when dust or a cinder gets into the eye?
9. What caution about rubbing the eye when any foreign substance gets into it?
10. How would you take good care of the eyes?
11. What is the effect of alcohol upon the eyes?
12. What is the effect of tobacco upon the eyes?
13. How would you get a room ready for a sick person?
14. Why should the sick room be kept neat and trim?
15. What would you do about putting things into your mouth that others have had in their mouths?
16. In what simple but common way are diseases often spread?
17. Give some hints about the care of the ears.
18. What can you say about the care of the finger nails and the hair?
19. Can you think of other hints about wearing clothing?
20. What would you advise about giving paregoric or soothing sirup to young children?
21. What other simple rules of health can you mention?

LESSON XLIV

HOW ALL PARTS OF THE BODY WORK TOGETHER FOR ITS GOOD

Like any other wonderful machine that is busily at work, our bodies must be watched over and protected. The more we study our bodily life, the better we understand how all the different parts of our bodies work together for the common good. You know that if somebody tickles your foot, even when you are asleep, the muscles of your leg will pull it away. If somebody makes believe strike suddenly at your eye, the lids will shut to protect it.

Every child knows that when he pricks his finger with a needle, touches a hot stove, or has eaten unwholesome fruit, such as an unripe apple, he will most likely suffer pain. What is it that warns us of danger and controls every act of our bodily life? What is the wonderful agent which governs every part of our bodies? It is the **nervous system**; and by this we mean the **brain** — the pulpy mass inside

of the skull — and the little white, glistening threads called **nerves**, running out from it.

The nervous system is like a complete telephone system. The brain is the central office; and the thousands of nerves branching off to all parts of the body are the telephone wires. Messages are constantly being sent to the brain to tell the story of what is going on in various parts of the body. The brain on receiving the news at once sends back its orders as to what must be done; and the orders fly through the nerves faster than it is possible for us to think.



DIAGRAM ILLUSTRATING THE
GENERAL ARRANGEMENT OF
THE NERVOUS SYSTEM

Seen from behind

Thus, if you accidentally put your hand on a hot stove, you pull it away in a moment. Yet this is really what happened: a message, though not



NERVES ON THE BACK
OF THE LEFT FORE-
ARM AND HAND

in words, was flashed along the nerves from your hand to the brain, "We are burnt!" The brain at once returned the message to the muscles, "Pull the hand away!" Then the muscles contracted, and the hand was removed.

More wonderful still, if we exert our will, or "make up our mind" as we call it, to write with a pen, to pick a flower, or to call the name of some friend, we can do it. The mind, or brain, wills to do this or that thing. This mind, which feels and thinks, but which we cannot see, forms the real part of our selves. It is the power to feel, to know, to reason, and to will that makes us what we are.

When we stop to think about it, how wonderful it is! The all-wise Creator, in his goodness and wisdom, has given us bodies which, in the words of the Bible, are "fearfully and wonderfully made."

It has been left to us to take care of this bodily machine of ours, to keep it clean and neat, and to watch over it and protect it from accident and harm. By giving it proper rest at night, by bathing it every day, and by giving it good wholesome food, we are doing something toward taking good care of it.

God has given into our keeping this machine, — the body; and whether it goes well or ill depends very much upon the care we take of it.

LESSON XLV

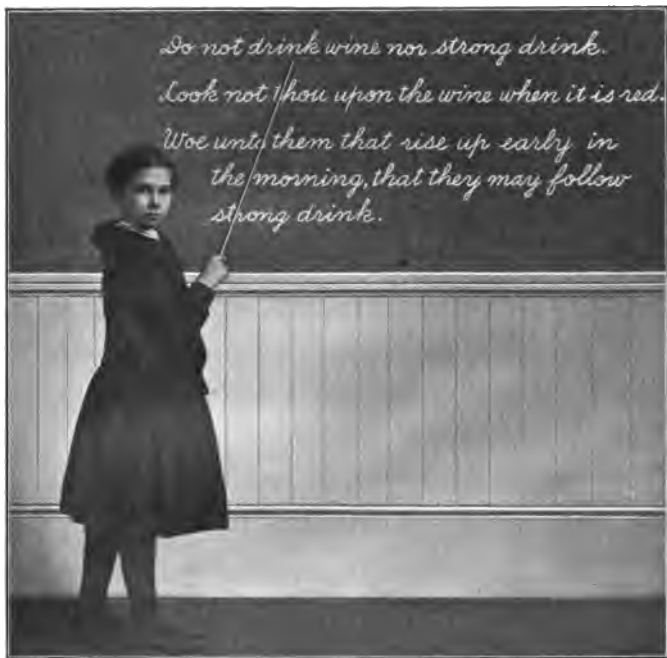
WHAT COMES AT LAST FROM DRINKING ALCOHOLIC LIQUORS

The brain, or the thinking part of ourselves, is a most precious gift. We should strive to keep it healthy and vigorous. It is very unwise to do anything to injure it; and yet many do inflict injury on it. How? Why, by poisoning its delicate tissues with strong drink.

A part of the work of the brain and the nerves, as we have learned, is to make the muscles act together in such a way that we can move our limbs as we wish. Alcohol poisons the brain and the nerves, and causes them to lose their control over the muscles. The messages sent along the nerve wires from the brain that is confused by strong drink go astray. The speech is thick and the gait unsteady.

Now you must know that the brain that is injured by alcohol loses its power to think clearly. It is

more likely to think evil thoughts than good thoughts. You have doubtless heard it said of some persons that they have weak wills, and of



A LESSON FROM THE BLACKBOARD

others that they have strong wills. A person with a weak will may be easily influenced to do what he knows to be wrong.

Alcohol weakens the will by injuring the brain, which is the seat of the will. Slowly, but surely, the person who injures his brain with alcohol loses his self-control. He may even become insane for the time. This is the reason why so many cruel deeds and brutal crimes are done while men are under the influence of strong drink.

You will not be surprised now to know that strong drink has the power to change a good man into a brute. It can make him so cruel to his wife and children that he is ready to let them starve, or to sell their clothing to buy drink for himself. The bodily and mental wrecks caused by alcoholic liquors meet our sight on every side.

You would hardly think that men and women could ever fall so low. If they had known, before they began to drink, that alcohol has the power of making those who drink it want to keep drinking it until they are ruined by it, they would have been careful about drinking the first drop; but they thought they could take a little when they wanted to, and let it alone when they wanted to. This false idea has led many to drunkenness.

There comes a time in the life of every drunkard when he realizes that alcohol is ruining him and that he would be better off without it; but by that time it may have made his will too weak to resist the continual craving for more of it, which the alcohol itself has caused.

It is also a sad fact that the children of drinking parents are in greater danger of forming the appetite for alcohol by taking a little whisky, wine, or hard cider than are the children of parents who do not drink.

Did you ever think what untold poverty, suffering, and disgrace are brought upon innocent people by those who use strong drink? The bright, ambitious lad may become a drunkard, and his parents may go down to their graves broken-hearted. The prosperous mechanic may die a drunkard, and his once happy home may be lost, and his wife and children left to struggle with poverty and disgrace.

A little exposure, and the apparently robust business man dies suddenly from pneumonia or heart failure. It is perhaps known to a few friends that he was a steady drinker in secret. You know that

those who sap their health with alcohol have often little strength to withstand any sudden illness.

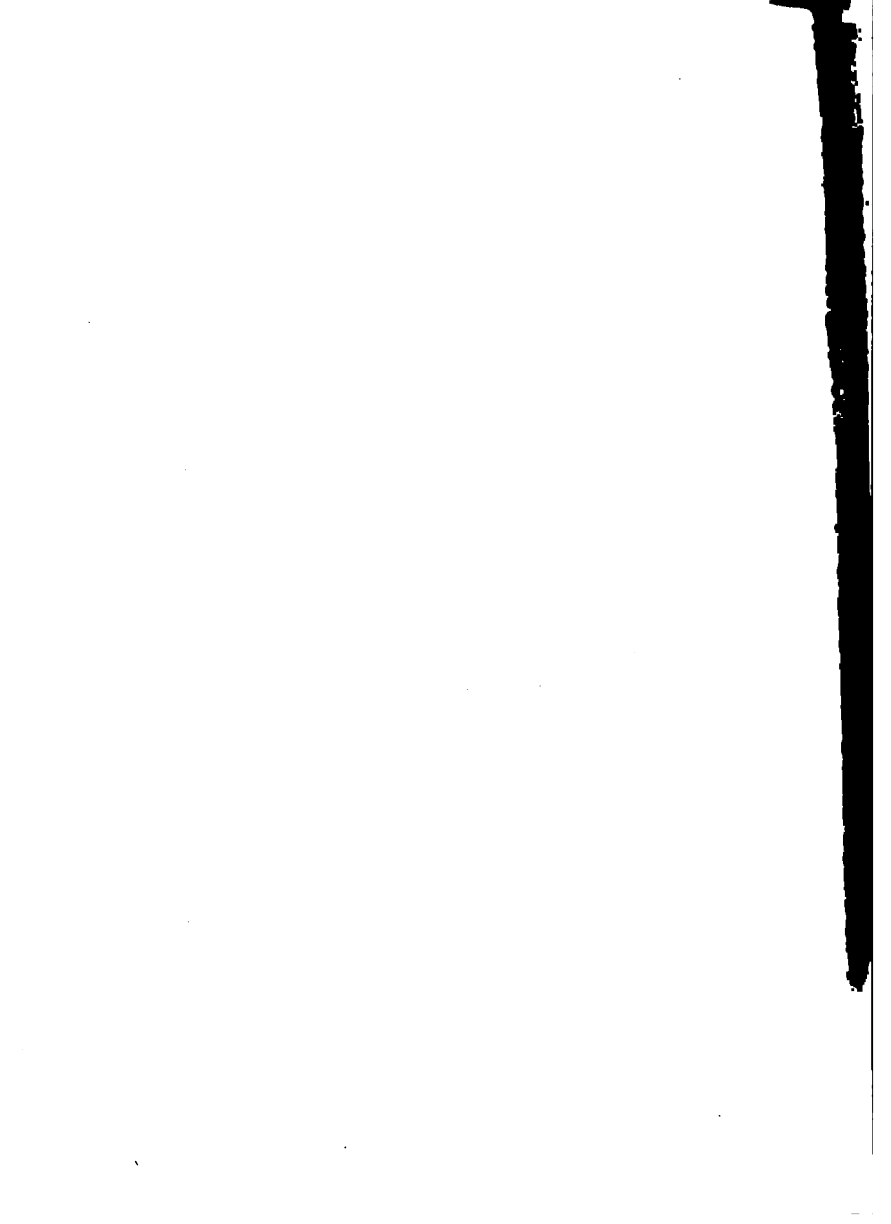


A BLACKBOARD EXERCISE

Property of all kinds is mortgaged; household goods are sold for debt; wages and valuable time are lost to the workingman; sober and industrious citizens are heavily taxed to support workhouses and jails,—all this and a hundredfold more is the price paid for habitual indulgence in alcoholic liquors.

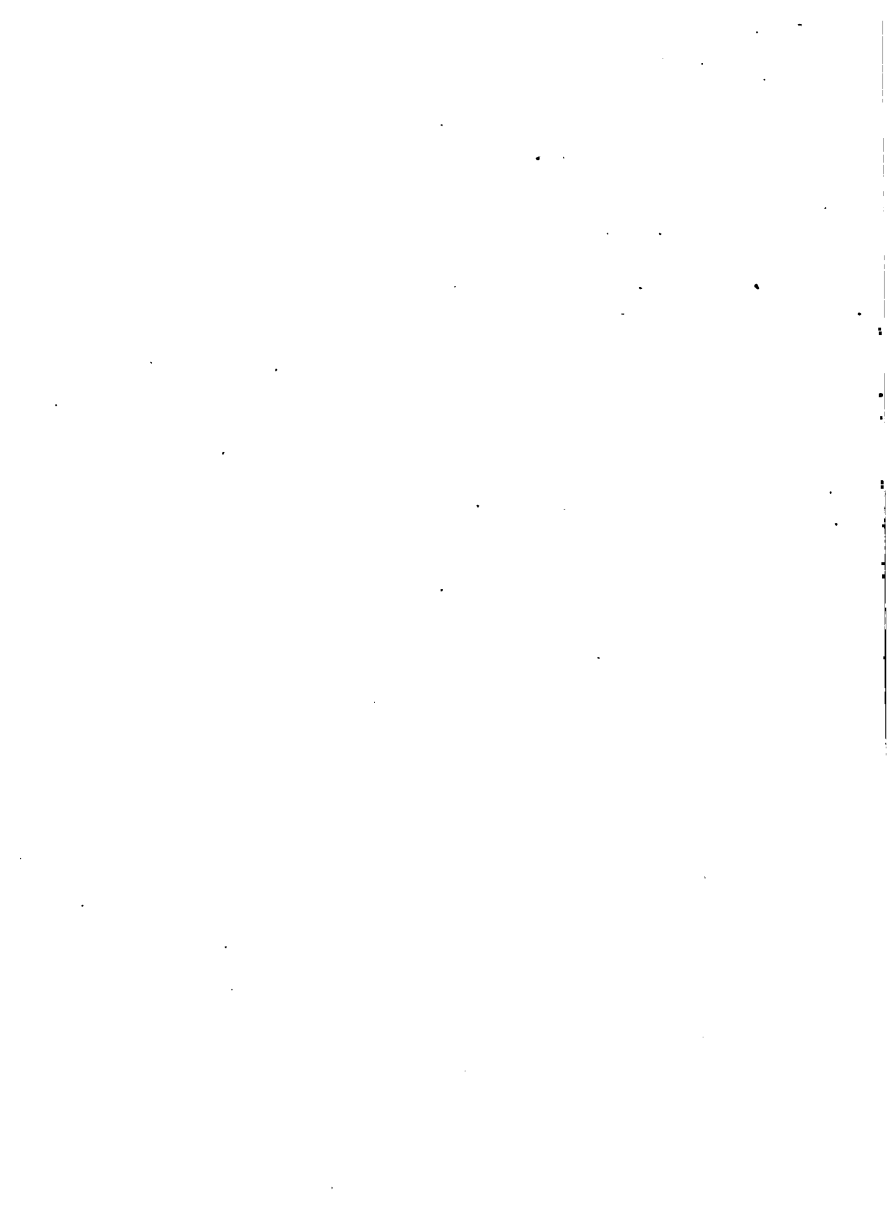
REVIEW QUESTIONS

1. Why is it very unwise to injure the brain?
2. How do many people injure their brains and nerves?
3. What is one part of the work of the brain and nerves?
How does alcohol interfere with their work?
4. What can you say of the messages sent out by the brain when it is confused by alcohol?
5. How does alcohol affect the speech and the gait?
6. What can you say of a person's thoughts when his brain is injured by alcoholic drink?
7. What can you say of a person who has a weak will? How does alcohol affect the will?
8. What does a person lose when his brain is injured by alcohol?
9. Why does alcohol so often lead to wrongdoing?
10. How may strong drink change a man? What may it make him do?
11. What should such a person have known before he began to drink?
12. What false idea about drinking has led many to drunkenness?
13. Why does the drunkard not stop drinking when he finds that alcohol is injuring him?
14. What created the appetite he finds it so hard to resist?
15. What effect may the drinking habits of parents have upon their children?
16. How does alcohol unfit a person to bear sudden illness?



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